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Clark's
Transit Tables
1883

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TRANSIT TABLES

FOR POPULAR USE

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TRANSIT TABLES

FOR

1883

GIVING THE GREENWICH MEAN TIME OF THE TRANSIT OF THE SUN, AND OF CERTAIN STARS, FOR EVERY DAY IN THE YEAR

WITH AN EPHEMERIS OF THE SUN, MOON, AND PLANETS AND OTHER INFORMATION

COMPUTED FROM THE NAUTICAL ALMANAC FOR POPULAR USE

BY

LATIMER CLARK

M.I.C.E. &c.

LONDON

ALFRED J. FROST

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PREFACE.

THE following tables are especially designed to furnish facilities for obtaining correct time by means of the transit instrument in any part of the world. They give the time of transit at Greenwich of the sun, and of five of the principal stars, for every day in the year in ordinary Greenwich time. They are computed from the 'Nautical Almanac,' the daily variations in Right Ascension of the stars being included, and to ensure accuracy they are calculated in duplicate, two places of decimals being used.

The Catalogue of 'Additional Stars' given each fortnight shows the difference of Right Ascension between the first star on the daily list of transits, which is used as a datum, and the stars named in the Catalogue. The comparison is made on a particular day in each fortnight, and is only strictly accurate on that day, but the relative changes in Right Ascension in a few days are so minute that they may safely be disregarded. A few high southern stars are included in the list for the use of persons residing in the southern hemisphere.

These tables enable the observer by mere inspection, or by the simplest addition, to obtain the mean time of transit of about twenty-four stars for every evening in the year, and it is intended to publish

them annually. In a little work entitled *A treatise on the Transit Instrument as applied to the determination of time, for the use of country gentlemen. London*, 1882, the author has given a full description of the use of the transit instrument for the purpose above mentioned, and of the method of fixing and adjusting it, and making the necessary calculations and corrections; but the following instructions for employing these tables may be found useful here.

The tables give the Greenwich mean time of transit of the sun and stars at Greenwich, and (subject to minute corrections) they practically give correct *local* time in any part of England. As Greenwich time is, however, universally adopted, it is necessary to convert this local time into Greenwich time, which is readily done by the addition of a certain constant correction, which, when once determined, never varies. This constant is easily obtained once for all by ascertaining the difference of longitude between our station and Greenwich in degrees and minutes, and converting this longitude into time at the rate of four minutes for each degree, and four seconds for each minute of longitude. The longitudes will be found written in plain figures on the top and bottom of every ordnance map. If the station lie to the west of Greenwich, this difference in time has to be added to, and if to the east, it has to be subtracted from the times of transit given in the tables; the result will be Greenwich time. Ipswich, for example, is about 1° 14′ east of Greenwich, the constant to be subtracted is therefore 4 min. 56 sec. of time. Liverpool is about 3° 4′ west of Greenwich, the

constant to be added is therefore 12 min. 16 sec. of time. Having thus obtained our correction for longitude, it is easy to ascertain the time of transit of the sun, or of any star at our station. For example, an observer at Liverpool will have to carry in his memory the constant 12 min. 16 sec., thus:—

	H.	M.	S.
Jan. 10.—Transit of α Andromedæ at Greenwich	4	42	54·6
Add correction for W. longitude of Liverpool . .		12	16·0
Transit of α Andromedæ at Liverpool in Greenwich time	4	55	10·6

In using the list of 'additional stars,' we take out the time of the 'datum star' for the evening in question. The name of this star is indicated at the head of the list, and we add to it the time opposite the required star, and also our correction for longitude, and the result is the Greenwich time of transit of the star at our station. For example:—

	H.	M.	S.
Jan. 2.—Transit of α Ceti at Oxford.			
α Andromedæ (the datum star) transits at Greenwich at	5	14	22
α Ceti (the 'additional' star) has a difference of time of	2	53	22
Add constant for longitude (1° 15′ 30″ W. of Greenwich) at 4 min. per degree		5	2
Transit of α Ceti at Oxford, in Greenwich time	8	12	46

Having thus ascertained the time of transit of any star at our station, the correction of our clock or watch becomes a very simple matter; for example:—

	H.	M.	S.
Jan. 2.—α Ceti transits at Oxford	8	12	46
But by our watch it passed at	8	12	21
Therefore our watch is slow			25

These tables are primarily intended for the use of persons living in England, but they will be found equally useful to persons residing in remote or isolated stations in any part of the world, as for example, on the Continent, or in America, enabling them by means of the transit instrument to obtain either their own local time or Greenwich time with extreme accuracy and facility. The star tables will give an observer in any part of the world his correct local time, if he adds a uniform constant (see page 36 of the work above-named) consisting of the difference between his longitude from Greenwich regarded as sidereal time, and its value converted into mean time by the table given for that purpose at page 29. This constant will never exceed two minutes in any part of the world.

Example :—

	H.	M.	S.
Singapore. Longitude 103° 53′ E. at 4 min. per degree	6	55	32·0
The same converted into mean time . . .	6	54	23·92
Difference		1	8·08

This difference (which may also be obtained by allowing 9·8296 seconds for each hour of longitude) is a constant value to be added to the transit times of the stars as given in the tables, if he lives east of Greenwich, and to be subtracted if he lives west; if his longitude be given in degrees instead of in time, he may obtain the same constant by allowing ·6553 seconds for each degree of longitude.[1] This constant, which we will call the *sidereal constant*, when once

[1] Astronomers only express longitude in time, but the ordinary observer will generally have recourse to a map or atlas, where the longitude is expressed in degrees.

ascertained for any locality, never changes, and applies to all stars.

Example :—

	H.	M.	S.
June 1.—α Libræ transits at Greenwich (as per table)	10	4	17·81
Add sidereal constant for Bombay, viz. 72° 53′ E. at ·6553 secs. per degree			47·76
α Libræ transits at Bombay in Bombay time .	10	5	5·57

Should he, however, desire to obtain Greenwich time for the purpose of rating ship's chronometers or other uses, he has merely, if his station be west of Greenwich, to add to the local time thus obtained his longitude from Greenwich stated in time (at the rate of four minutes to each degree), or if his station be east of Greenwich to subtract it.

Example :—

	H.	M.	S.
May 1.—δ Leonis transits at Greenwich (as per table)	8	30	14·15
Subtract sidereal constant for Gibraltar 5° 21′ W. at ·6553 secs. per degree			3·50
Local time at Gibraltar	8	30	10·65
Add 5° 21′ W. longitude of Gibraltar, expressed in time		21	24·00
Transit of δ Leonis at Gibraltar in Greenwich time	8	51	34·65

The sun's transit may also be employed, but with rather less facility (if great accuracy be required) since owing to the continual change in the equation of time (see page 31) it requires a slightly different correction for each day and for each locality. The sun souths at every place on the globe at twelve o'clock in local time, plus or minus the 'equation of time' *at that instant.* The equation is sometimes increasing and sometimes decreasing ; it changes at

some periods of the year more than a second per hour, so that during the time occupied by the sun in moving from one meridian to another, the equation itself may have varied very sensibly. The correction *per hour* is given in the 'Nautical Almanac' for each day at noon, and may be applied in the manner explained at page 31, or preferably by the following rules, employing the data contained in the present tables.

For stations East of Greenwich. Ascertain the difference between the time of the sun's southing yesterday and to-day, and multiply this difference in seconds of time by the longitude in degrees, and divide by 360. If the daily equation (or the time of the sun's southing) be increasing, this correction has to be deducted from the time of southing given in the tables; if decreasing, it has to be added.

For stations West of Greenwich. Ascertain the difference between the time of the sun's southing to-day and to-morrow, multiply this difference in seconds by the longitude in degrees, and divide by 360. If the equation, or time of southing, be increasing, the correction has to be added; if decreasing, it has to be subtracted. If a table of these corrections be prepared for the year, it will serve for any future years, and as the changes are very minute, a constant for each tenth day will usually suffice.

Example:—

	H.	M.	S.
Cape Town, South Africa. Longitude 18° 23′ West.			
Jan. 1.—Sun souths at Greenwich	12	3	45·10
Jan. 2. „ „ „	12	4	13·32
Difference in 24 hours (increasing) . . .			28·22

$$\frac{18^{\circ}\ 23' \times 28^{\text{sec.}}\cdot 22}{360} = 1^{\text{sec.}}\cdot 44 \text{ seconds.}$$

(or $360^{\circ} : 18^{\circ}\ 23' :: 28^{\text{sec.}}\cdot 22 : 1^{\text{sec.}}\cdot 44$).

Jan. 1.—Sun souths at Greenwich (as per table) .	12	3	45·10
Add correction as above			1·44
Sun souths at Cape Town in local time . .	12	3	46·54

These corrections, when applied to the transits given in the tables, give the true local time at the observer's station, but he may perhaps be living in the neighbourhood of some large city, such as New York or Calcutta, which gives time to the whole district. In such case, after applying the sidereal or solar constants above described which give him local time, he will in addition add or subtract the 'correction for longitude' for the required locality as described in Chapter X. of the work referred to, and at page 6 of this preface.

Example:—

Cliffville 1° 15′ East of New York, U.S.
Longitude of New York 74° 0′ W. Longitude of Cliffville 72° 45′ W.

	M.	S.
Sidereal constant for Cliffville 72° 45′ West, at ·6553 sec. per degree, to be added	0	47·67
Correction for longitude, New York, Cliffville 1° 15′ E. at 4 min. per degree, to be subtracted .	5	0·00
True correction, or constant, for obtaining New York time from transits of stars at Cliffville, to be subtracted	4	12·33

In the above instance the *sidereal constant* gives us true local time at Cliffville, and the *correction for longitude* converts this into New York time.

The altitudes (and declinations) of the stars are only given approximately, as they vary with the latitude; the necessary correction may be applied in the manner explained at page 38, but the simplest way to make the correction in practice is to slacken the screws which clamp the divided circle on to the axis of the telescope and to turn the circle round till it points correctly to the altitude (or declination) of

any known star as given in the tables. It will now point correctly to all other stars, subject to slight errors due to refraction.

Some of the brighter stars are often visible in the telescope by daylight in a clear sky; the time of transit of a few of the more important ones is therefore given in footnotes. A little practice is at first necessary to detect them, but when once seen they can be observed more accurately by daylight than by artificial light; it is only necessary to adjust the index to the altitude given in the tables, and at the proper moment the star will be seen crossing the wires, though invisible to the naked eye.

As these tables will probably fall into the hands of some who are not acquainted with the transit instrument, it may be well to explain how easily it may be fixed and adjusted. In order to fix the instrument accurately in position in any part of the world, it is only necessary to choose a suitable site facing south, and to point the telescope to the true meridian as nearly as can be guessed, at the same time taking care to adjust the level with extreme accuracy, reversing it end for end. Now note the times of passage across the centre wire of any two stars given in the tables which differ considerably in their altitude. Assume that the higher star passed correctly at the time stated in the tables, and making the necessary allowance for the error of your watch, see if the low star also passed at the correct time. If it did, which is extremely improbable, your instrument is pointing correctly to the meridian. More probably there will be some error, and the low star appeared

to pass either too soon or too late. The correction now necessary is of the simplest character; if the star passed too soon, the instrument was pointing too much to the east of your meridian; if it passed too late, it was pointing too much to the westward. Before repeating the observation, you will require to note some distant object in a line with the centre wire, or preferably to set up some sort of a meridian mark to fix the position; then directing the telescope a little to the eastward or westward as the case may be, observe another pair of high and low stars, always levelling the instrument with great care and always assuming the high star to give the more correct time.[1] By this means the observer will in two or three evenings have easily adjusted his transit so as to give his time correct to within four or five seconds either with high or low stars, but he must not rest satisfied until he can determine his time by a single observation true to a second, or if employing all three wires, to about half a second.

[1] Of course the shortest way to do this is to make use of the differences given in the list of 'Additional Stars' for each fortnight. For example, in any evening in May, I take the transits of α Libræ and β Ursæ Minoris with a watch, and without any regard to its error I find their differences as follows:—

	Times given by watch.				Times given in table.		
	H.	M.	S.		H.	M.	S.
β Ursæ Minoris . .	2	58	56	. . . .	3	42	35
α Libræ	2	50	12	. . . .	3	35	57
Observed difference		8	44	True difference		6	38

This true difference, which serves for the whole month, shows us that every night α Libræ, the low star, passes our meridian 6m. 38s. before β Ursæ Minoris, the high star; but by our observation it passed 8m. 44s. before it. The low star, therefore, came too soon, and our telescope was pointing too much to the east. Supposing our meridian mark to be 100 yards distant, we may roughly move it about a quarter of an inch for each second of error and repeat our observations.

The transit instrument has thus the advantage that it provides the means of checking its own results, so that the observer in any part of the world is never left in any uncertainty as to the correctness of his adjustments or the accuracy of his time, and in fixing his instrument it is not necessary that he should know either his geographical position or have any standard of time, though these points become essential if he requires other than local time. Although it has been necessary to give the means of obtaining time anywhere with scientific precision, the reader will of course perceive that for the purposes of practical time-keeping many of the corrections given are unimportant and may be neglected. He will observe with the centre wire only; he will carry in his memory the constant of his station. A glance at the tables and the roughest mental calculation will show him about when to expect any particular star. He will adjust his altitude circle by the fireside, and he may easily take his transit and return to the house within five minutes. The operation requires no special skill or practice, and a really well made transit instrument with all necessary equipment may be obtained for less than ten pounds; every educated person on the globe has therefore at his command the means of readily keeping time to any degree of accuracy he may think desirable.

As a good transit instrument at a low price is a desideratum, the author has taken some pains to obtain one; this instrument, which is described in the advertisements, has given the greatest satisfaction to all who have used it.

In order to make the work generally useful to

astronomers, an Ephemeris of the positions of the Sun, Moon, and Planets has been appended, with other astronomical information. This feature may probably be found capable of both improvement and enlargement in future editions, and the author would be glad to receive any suggestions for that purpose.

These transit tables are at present but little known, and can only become more so by private recommendation. As the demand for them is necessarily at first very limited, their production is attended with some trouble and pecuniary loss; it is hoped therefore that those who find them useful will take every opportunity of making them known to their friends both in this country and abroad, in order that they may eventually become self-supporting.

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January 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Andromedæ 66° 58′	α Persei 87° 58′	α Tauri (Aldebaran) 54° 47′	α Aurigæ (Capella) 84° 24′	Polaris 52° 48′ (North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1. Mon.	12 3 45·10	15 30	5 18 17·93	8 31 26·18	9 44 27·57	10 23 12·51	6 32 7·8
2. Tues.	12 4 13·32	15 35	5 14 22·00	8 27 30·25	9 40 31·65	10 19 16·60	6 28 11·1
3. Wed.	12 4 41·20	15 41	5 10 26·08	8 23 34·33	9 36 35·74	10 15 20·68	6 24 14·3
4. Thur.	12 5 8·72	15 47	5 6 30·15	8 19 38·40	9 32 39·82	10 11 24·77	6 20 17·6
5. Fri.	12 5 35·85	15 54	5 2 34·23	8 15 42·47	9 28 43·91	10 7 28·86	6 16 20·9
6. Sat.	12 6 2·55	16 1	4 58 38·30	8 11 46·54	9 24 47·99	10 3 32·94	6 12 24·2
7. Sun.	12 6 28·80	16 8	4 54 42·38	8 7 50·62	9 20 52·08	9 59 37·03	6 8 27·5
8. Mon.	12 6 54·55	16 16	4 50 46·45	8 3 54·69	9 16 56·16	9 55 41·12	6 4 30·7
9. Tues.	12 7 19·78	16 24	4 46 50·53	7 59 58·76	9 13 0·25	9 51 45·21	6 0 33·8
10. Wed.	12 7 44·46	16 33	4 42 54·60	7 56 2·84	9 9 4·33	9 47 49·29	5 56 36·9
11. Thur.	12 8 8·56	16 42	4 38 58·68	7 52 6·91	9 5 8·42	9 43 53·38	5 52 39·9
12. Fri.	12 8 32·05	16 52	4 35 2·76	7 48 10·98	9 1 12·50	9 39 57·46	5 48 43·0
13. Sat.	12 8 54·90	17 2	4 31 6·83	7 44 15·05	8 57 16·58	9 36 1·54	5 44 46·0
14. Sun.	12 9 17·10	17 12	4 27 10·91	7 40 19·12	8 53 20·67	9 32 5·63	5 40 49·2
15. Mon.	12 9 38·61	17 23	4 23 14·99	7 36 23·19	8 49 24·75	9 28 9·71	5 36 52·3

January 16 to 31.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Arietis			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
3–4	γ^2 Ceti	0	36	33·54	41	15	2	44	N
2–3	α Ceti	0	55	26·07	42	8	3	37	N
2	α Persei	1	15	12·50	87	58	49	27	N
3	ε Eridani	1	26	36·28	28	40	9	51	S
3	η Tauri	1	39	41·33	62	15	23	44	N
3	γ^1 Eridani	1	51	41·36	24	40	13	51	S
1	α Tauri (*Aldebaran*)	—	—	—	54	47	16	16	N
3	ι Aurigæ	2	48	21·26	71	30	32	59	N
1	α Aurigæ (*Capella*)	—	—	—	84	23	45	52	N
1	β Orionis (*Rigel*)	3	7	49·96	30	11	8	20	S
2	β Tauri	3	17	47·80	67	1	28	30	N
2	δ Orionis	3	24	54·20	38	8	0	23	S
3	α Leporis	3	26	26·27	20	36	17	55	S
3	ε Orionis	3	29	8·26	37	14	1	17	S
3–2	κ Orionis	3	41	2·16	28	48	9	43	S
1	α Orionis	—	—	—	45	54	7	23	N
1	α Argus (*Canopus*)	4	20	4·97	(South)		52	38	S
2–3	γ Geminorum	4	29	39·28	55	1	16	30	N
1	α Canis Majoris (*Sirius*)	4	38	39·96	21	57	16	34	S
2–1	ε Canis Majoris	4	52	39·90	9	42	28	49	S
1	α^2 Geminorum (*Castor*)	5	25	41·32	70	39	32	8	N

	°	′		h.	m.	s.
α Lyræ (by daylight)	77	12	Subtract	7	26	24·92 from α Arietis.

These tables are primarily intended for the use of persons living in England, but they will be found equally useful to persons residing in remote or isolated stations in any part of the world, as for example, on the Continent, or in America, enabling them by means of the transit instrument to obtain either their own local time or Greenwich time with extreme accuracy and facility. The star tables will give an observer in any part of the world his correct local time, if he adds a uniform constant (see page 36 of the work above-named) consisting of the difference between his longitude from Greenwich regarded as sidereal time, and its value converted into mean time by the table given for that purpose at page 29. This constant will never exceed two minutes in any part of the world.

Example:—

	H.	M.	S.
Singapore. Longitude 103° 53′ E. at 4 min. per degree	6	55	32·0
The same converted into mean time . . .	6	54	23·92
Difference		1	8·08

This difference (which may also be obtained by allowing 9·8296 seconds for each hour of longitude) is a constant value to be added to the transit times of the stars as given in the tables, if he lives east of Greenwich, and to be subtracted if he lives west; if his longitude be given in degrees instead of in time, he may obtain the same constant by allowing ·6553 seconds for each degree of longitude.[1] This constant, which we will call the *sidereal constant*, when once

[1] Astronomers only express longitude in time, but the ordinary observer will generally have recourse to a map or atlas, where the longitude is expressed in degrees.

ascertained for any locality, never changes, and applies to all stars.

Example :—

	H.	M.	S.
June 1.—α Libræ transits at Greenwich (as per table)	10	4	17·81
Add sidereal constant for Bombay, viz. 72° 53′ E. at ·6553 secs. per degree			47·76
α Libræ transits at Bombay in Bombay time .	10	5	5·57

Should he, however, desire to obtain Greenwich time for the purpose of rating ship's chronometers or other uses, he has merely, if his station be west of Greenwich, to add to the local time thus obtained his longitude from Greenwich stated in time (at the rate of four minutes to each degree), or if his station be east of Greenwich to subtract it.

Example :—

	H.	M.	S.
May 1.—δ Leonis transits at Greenwich (as per table)	8	30	14·15
Subtract sidereal constant for Gibraltar 5° 21′ W. at ·6553 secs. per degree			3·50
Local time at Gibraltar	8	30	10·65
Add 5° 21′ W. longitude of Gibraltar, expressed in time		21	24·00
Transit of δ Leonis at Gibraltar in Greenwich time	8	51	34·65

The sun's transit may also be employed, but with rather less facility (if great accuracy be required) since owing to the continual change in the equation of time (see page 31) it requires a slightly different correction for each day and for each locality. The sun souths at every place on the globe at twelve o'clock in local time, plus or minus the 'equation of time' *at that instant.* The equation is sometimes increasing and sometimes decreasing ; it changes at

February 16 to 28.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Tauri (Aldebaran) 54° 48′	μ Geminorum 61° 5′	α Canis Majoris (Sirius) 21° 57′	α² Geminorum (Castor) 70° 39′	β Geminorum (Pollux) 66° 49′
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
16. Fri.	12 14 18·61	26 11	6 43 35·25	8 29 58·90	8 54 1·24	9 41 2·74	9 52 2·11
17. Sat.	12 14 14·42	26 32	6 39 39·32	8 26 2·98	8 50 5·32	9 37 6·83	9 48 6·19
18. Sun.	12 14 9·52	26 53	6 35 43·40	8 22 7·06	8 46 9·40	9 33 10·91	9 44 10·28
19. Mon.	12 14 3·91	27 14	6 31 47·47	8 18 11·14	8 42 13·48	9 29 15·00	9 40 14·36
20. Tues.	12 13 57·62	27 35	6 27 51·55	8 14 15·22	8 38 17·56	9 25 19·08	9 36 18·45
21. Wed.	12 13 50·66	27 57	6 23 55·62	8 10 19·30	8 34 21·64	9 21 23·16	9 32 22·53
22. Thur.	12 13 43·05	28 19	6 19 59·70	8 6 23·37	8 30 25·71	9 17 27·24	9 28 26·61
23. Fri.	12 13 34·82	28 41	6 16 3·77	8 2 27·45	8 26 29·79	9 13 31·32	9 24 30·70
24. Sat.	12 13 25·97	29 3	6 12 7·85	7 58 31·53	8 22 33·87	9 9 35·40	9 20 34·78
25. Sun.	12 13 16 53	29 25	6 8 11·92	7 54 35·60	8 18 37·94	9 5 39·48	9 16 38·86
26. Mon.	12 13 6·53	29 47	6 4 16·00	7 50 39·68	8 14 42·02	9 1 43·56	9 12 42·94
27. Tues.	12 12 55·97	30 10	6 0 20·07	7 46 43·76	8 10 46·10	8 57 47·64	9 8 47·02
28. Wed.	12 12 44·89	30 32	5 56 24·15	7 42 47·84	8 6 50·18	8 53 51·72	9 4 51·11

February 16 to 28.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Tauri.			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
3	ι Aurigæ	0	20	7·07	71	30	32	59	N
1	α Aurigæ (*Capella*)	0	38	44·83	84	23	45	52	N
1	β Orionis (*Rigel*)	0	39	35·86	30	11	8	20	S
2	δ Orionis	0	56	40·14	38	8	0	23	S
3–2	κ Orionis	1	12	48·10	28	48	9	43	S
1	α Orionis	1	19	25·07	45	54	7	23	N
3	μ Geminorum	—	—	—	61	5	22	34	N
1	α Argus (*Canopus*)	1	51	50·58	(South)		52	38	S
2–3	γ Geminorum	2	1	25·34	55	1	16	30	N
1	α Canis Majoris (*Sirius*)	—	—	—	21	57	16	34	S
2–1	ε Canis Majoris	2	24	25·91	9	42	28	49	S
3	β Canis Minoris	2	51	8·46	47	2	8	31	N
1	α^2 Geminorum (*Castor*)	—	—	—	70	39	32	8	N
1	α Canis Minoris (*Procyon*)	3	3	28·76	44	2	5	31	N
1–2	β Geminorum (*Pollux*)	—	—	—	66	49	28	18	N
3	15 Argus	3	32	47·02	14	33	23	58	S
3–4	ε Hydræ	4	10	42·02	45	21	6	50	N
3	ι Ursæ Majoris	4	21	17·78	87	1	48	30	N
2	α Hydræ	4	51	50·73	30	22	8	9	S
3	θ Ursæ Majoris	4	55	2·20	89	17	52	12	N
1–2	α Leonis (*Regulus*)	5	32	2·34	51	3	12	32	N

	°	′		h.	m.	s.
α Lyræ (by daylight)	77	12	Subtract	9	54	37·89

March 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Aurigæ (Capella) 84° 24′	α Orionis 45° 54′	β Geminorum (Pollux) 66° 49′	ε Hydræ 45° 21′	ι Ursæ Majoris 87° 1′
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1. Thur.	12 12 33·30	30 55	6 31 13·00	7 11 53·31	9 0 55·19	10 3 10·36	10 13 46·09
2. Fri.	12 12 21·21	31 18	6 27 17·07	7 7 57·39	8 56 59·27	9 59 14·45	10 9 50·18
3. Sat.	12 12 8·66	31 41	6 23 21·14	7 4 1·46	8 53 3·35	9 55 18·53	10 5 54·26
4. Sun.	12 11 55·65	32 4	6 19 25·20	7 0 5·54	8 49 7·43	9 51 22·62	10 1 58·34
5. Mon.	12 11 42·20	32 27	6 15 29·27	6 56 9·61	8 45 11·50	9 47 26·70	9 58 2·42
6. Tues.	12 11 28·33	32 50	6 11 33·34	6 52 13·69	8 41 15·58	9 43 30·78	9 54 6·50
7. Wed.	12 11 14·06	33 14	6 7 37·40	6 48 17·76	8 37 19·66	9 39 34·86	9 50 10·58
8. Thur.	12 10 59·40	33 37	6 3 41·47	6 44 21·84	8 33 23·74	9 35 38·95	9 46 14·66
9. Fri.	12 10 44·36	34 0	5 59 45·54	6 40 25·91	8 29 27·82	9 31 43·03	9 42 18·74
10. Sat.	12 10 28·96	34 24	5 55 49·61	6 36 29·99	8 25 31·89	9 27 47·11	9 38 22·82
11. Sun.	12 10 13·22	34 47	5 51 53·67	6 32 34·06	8 21 35·97	9 23 51·20	9 34 26·90
12. Mon.	12 9 57·16	35 11	5 47 57·74	6 28 38·14	8 17 40·05	9 19 55·28	9 30 30·98
13. Tues.	12 9 40·79	35 35	5 44 1·81	6 24 42·22	8 13 44·13	9 15 59·36	9 26 35·05
14. Wed.	12 9 24·12	35 58	5 40 5·88	6 20 46·29	8 9 48·20	9 12 3·44	9 22 39·13
15. Thur.	12 9 7·19	36 22	5 36 9·94	6 16 50·37	8 5 52·28	9 8 7·53	9 18 43·20

March 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Aurigæ	Altitude	Declination
		h. m. s.	° ′	° ′
2	β Tauri	0 10 48·97	67 1	28 30 N
1	α Orionis	— — —	45 54	7 23 N
3	μ Geminorum	1 7 39·00	61 5	22 34 N
1	α Argus (*Canopus*)	1 13 5·58	(South)	52 38 S
2–3	γ Geminorum	1 22 40·69	55 1	16 30 N
1	α Canis Majoris (*Sirius*)	1 31 41·34	21 57	16 34 S
2–1	ε Canis Majoris	1 45 41·20	9 42	28 49 S
3	β Canis Minoris	2 12 23·87	47 2	8 31 N
1	α^2 Geminorum (*Castor*)	2 18 42·91	70 39	32 8 N
1	α Canis Minoris (*Procyon*)	2 24 44·19	44 2	5 31 N
1–2	β Geminorum (*Pollux*)	— — —	66 49	28 18 N
3	15 Argus	2 54 2·44	14 33	23 58 S
3–4	ε Hydræ	3 31 57·54	45 21	6 50 N
3	ι Ursæ Majoris	— — —	87 1	48 30 N
2	α Hydræ	4 13 6·33	30 22	8 9 S
3	θ Ursæ Majoris	4 16 17·75	89 17 N	52 12 N
3	ε Leonis	4 30 25·97	62 49	24 18 N
1–2	α Leonis (*Regulus*)	4 53 18·02	51 3	12 32 N
2	γ^1 Leonis	5 4 39·03	58 57	20 26 N
1–6	η Argus	5 31 36·23	(South)	59 5 S
2	α Ursæ Majoris	5 47 31·74	100 54	62 23 N

α Lyræ (by daylight), 77 12 Subtract 10 33 21·60

March 16 to 31.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Canis Majoris (Sirius) 21° 57′	ε Hydræ 45° 21′	α Hydræ 30° 22′	ε Leonis 62° 49′	α Leonis (Regulus) 51° 3′
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
16. Fri.	12 8 50·00	36 46	7 3 55·38	9 4 11·61	9 45 20·41	10 2 40·05	10 25 32·10
17. Sat.	12 8 32·58	37 9	6 59 59·45	9 0 15·69	9 41 24·49	9 58 44·14	10 21 36·19
18. Sun.	12 8 14·94	37 33	6 56 3·52	8 56 19·77	9 37 28·57	9 54 48·23	10 17 40·28
19. Mon.	12 7 57·11	37 57	6 52 7·60	8 52 23·85	9 33 32·66	9 50 52·31	10 13 44·37
20. Tues.	12 7 39·12	38 20	6 48 11·67	8 48 27·94	9 29 36·74	9 46 56·40	10 9 48·45
21. Wed.	12 7 20·98	38 44	6 44 15·75	8 44 32·02	9 25 40·83	9 43 0·48	10 5 52·54
22. Thur.	12 7 2·72	39 8	6 40 19·82	8 40 36·10	9 21 44·91	9 39 4·57	10 1 56·63
23. Fri.	12 6 44·36	39 31	6 36 23·89	8 36 40·18	9 17 48·99	9 35 8·65	9 58 0·71
24. Sat.	12 6 25·93	39 55	6 32 27·97	8 32 44·26	9 13 53·07	9 31 12·73	9 54 4·80
25. Sun.	12 6 7·45	40 19	6 28 32·04	8 28 48·34	9 9 57·16	9 27 16·82	9 50 8·88
26. Mon.	12 5 48·94	40 42	6 24 36·12	8 24 52·42	9 6 1·24	9 23 20·90	9 46 12·97
27. Tues.	12 5 30·43	41 6	6 20 40·19	8 20 56·50	9 2 5·32	9 19 24·98	9 42 17·05
28. Wed.	12 5 11·94	41 29	6 16 44·26	8 17 0·58	8 58 9·40	9 15 29·06	9 38 21·14
29. Thur.	12 4 53·50	41 52	6 12 48·34	8 13 4·66	8 54 13·48	9 11 33·14	9 34 25·22
30. Fri.	12 4 35·12	42 16	6 8 52·41	8 9 8·74	8 50 17·57	9 7 37·23	9 30 29·31
31. Sat.	12 4 16·83	42 39	6 4 56·49	8 5 12·82	8 46 21·65	9 3 41·31	9 26 33·39

March 16 to 31.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Canis Majoris			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
2–1	ε Canis Majoris	0	13	59·84	9	42	28	49	S
3	β Canis Minoris	0	40	42·57	47	2	8	31	N
1	α^2 Geminorum (*Castor*)	0	47	1·58	70	39	32	8	N
1	α Canis Minoris (*Procyon*)	0	53	2·89	44	2	5	31	N
1–2	β Geminorum (*Pollux*)	0	58	1·00	66	49	28	18	N
3	15 Argus	1	22	21·14	14	33	23	58	S
3–4	ε Hydræ	—	—	—	42	21	6	50	N
3	ι Ursæ Majoris	2	10	51·92	87	1	48	30	N
2	α Hydræ	—	—	—	30	22	8	9	S
3	θ Ursæ Majoris	2	44	36·44	89	17	N 52	12	N
3	ε Leonis	—	—	—	62	49	24	18	N
1–2	α Leonis (*Regulus*)	—	—	—	51	3	12	32	N
2	γ^1 Leonis	3	32	57·84	58	57	20	26	N
1–6	η Argus	3	59	55·00	(South)		59	5	S
2	α Ursæ Majoris	4	15	50·54	79	6	N 62	23	N
2–3	δ Leonis	4	27	10·91	59	41	21	10	N
2	β Leonis	5	2	17·44	53	44	15	13	N
3	ε Corvi	5	23	15·41	16	33	21	58	S
3	δ Virginis	6	8	43·70	42	33	4	2	N

	°	′	h.	m.	s.
α Aurigæ (*Capella*) by daylight	84	23	Subtract 1	31	41·40

April 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	ι Ursæ Majoris 87° 1′	α Hydræ 30° 22′	α Leonis (Regulus) 51° 3′	δ Leonis 59° 41′	Polaris Lower Transit 50° 9′ (North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	*Midnight* h. m. s.
1 Sun.	12 3 58·64	43 2	8 11 52·45	8 42 25·73	9 22 37·48	10 28 11·62	12 35 18·7
2 Mon.	12 3 40·58	43 25	8 7 56·52	8 38 29·81	9 18 41·56	10 24 15·71	12 31 22·7
3 Tues.	12 3 22·66	43 48	8 4 0·59	8 34 33·89	9 14 45·65	10 20 19·80	12 27 26·6
4 Wed.	12 3 4·90	44 11	8 0 4·66	8 30 37·97	9 10 49·73	10 16 23·88	12 23 30·6
5 Thur.	12 2 47·31	44 34	7 56 8·73	8 26 42·05	9 6 53·81	10 12 27·97	12 19 34·6
6 Fri.	12 2 29·92	44 57	7 52 12·80	8 22 46·13	9 2 57·89	10 8 32·06	12 15 38·6
7 Sat.	12 2 12·73	45 19	7 48 16·87	8 18 50·21	8 59 1·98	10 4 36·15	12 11 42·7
8 Sun.	12 1 55·76	45 42	7 44 20·94	8 14 54·29	8 55 6·06	10 0 40·24	12 7 46·9
9 Mon.	12 1 39·03	46 4	7 40 25·01	8 10 58·37	8 51 10·14	9 56 44·32	12 3 51·1
							P.M.
10 Tues.	12 1 22·54	46 27	7 36 29·08	8 7 2·45	8 47 14·23	9 52 48·41	11 59 55·5
11 Wed.	12 1 6·32	46 49	7 32 33·15	8 3 6·53	8 43 18·31	9 48 52·50	11 55 59·9
12 Thur.	12 0 50·37	47 11	7 28 37·22	7 59 10·61	8 39 22·39	9 44 56·58	11 52 4·2
13 Fri.	12 0 34·70	47 32	7 24 41·28	7 55 14·69	8 35 26·47	9 41 0·67	11 48 8·4
14 Sat.	12 0 19·33	47 54	7 20 45·35	7 51 18·76	8 31 30·55	9 37 4·75	11 44 12·6
15 Sun.	12 0 4·28	48 16	7 16 49·41	7 47 22·84	8 27 34·63	9 33 8·83	11 40 16·8

April 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of ι Ursæ Majoris	Altitude	Declination
		h. m. s.	° ′	° ′
2	α Hydræ	— — —	30 22	8 9 S
3	θ Ursæ Majoris	0 33 44·51	89 17 N	52 12 N
3	ϵ Leonis	0 47 53·04	62 49	24 18 N
1–2	α Leonis (*Regulus*)	— — —	51 3	12 32 N
2	γ^1 Leonis	1 22 6·20	58 57	20 26 N
4	ρ Leonis	1 35 11·88	48 25	9 54 N
2	α Ursæ Majoris	2 4 58·72	79 6 N	62 23 N
2–3	δ Leonis	— — —	59 41	21 10 N
2	β Leonis	2 51 25·96	53 44	15 13 N
3	ϵ Corvi	3 12 23·98	16 33	21 58 S
1	α^1 Crucis	3 28 22·73	(South)	62 27 S
2–3	δ^2 Corvi	3 32 2·99	22 39	15 52 S
3	δ Virginis	3 57 52·36	42 33	4 2 N
3–2	ϵ Virginis	4 4 29·77	50 6	11 35 N
1	α Virginis (*Spica*)	4 27 6·86	27 58	10 33 S
2	η Ursæ Majoris	4 50 56·82	88 25	49 54 N

	° ′		h. m. s.
Capella (by daylight)	84 23	Subtract	3 42 33·32
Sirius ,,	21 57	,,	2 10 51·85

April 16 to 30.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Hydræ 30° 22′	α Leonis (Regulus) 51° 3′	δ Leonis 59° 41′	β Leonis 53° 44′	Polaris Lower Transit 50° 9′ (North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
16. Mon.	11 59 49·56	48 37	7 43 26·92	8 23 38·70	9 29 12·91	10 4 19·55	11 36 1·0
17. Tues.	11 59 35·19	48 58	7 39 31·00	8 19 42·78	9 25 17·00	10 0 23·64	11 32 25·2
18. Wed.	11 59 21·18	49 19	7 35 35·08	8 15 46·86	9 21 21·08	9 56 27·72	11 28 29·5
19. Thur.	11 59 7·55	49 40	7 31 39·15	8 11 50·94	9 17 25·16	9 52 31·81	11 24 33·8
20. Fri.	11 58 54·33	50 1	7 27 43·23	8 7 55·02	9 13 29·25	9 48 35·89	11 20 38·2
21. Sat.	11 58 41·52	50 21	7 23 47·31	8 3 59·10	9 9 33·33	9 44 39·98	11 16 42·7
22. Sun.	11 58 29·15	50 41	7 19 51·39	8 0 3·18	9 5 37·41	9 40 44·06	11 12 47·2
23. Mon.	11 58 17·22	51 2	7 15 55·47	7 56 7·26	9 1 41·49	9 36 48·15	11 8 51·7
24. Tues.	11 58 5·76	51 21	7 11 59·54	7 52 11·34	8 57 45·58	9 32 52·23	11 4 56·2
25. Wed.	11 57 54·78	51 41	7 8 3·62	7 48 15·42	8 53 49·66	9 28 56·32	11 1 0·8
26. Thur.	11 57 44·30	52 1	7 4 7·70	7 44 19·50	8 49 53·74	9 25 0·40	10 57 5·3
27. Fri.	11 57 34·33	52 20	7 0 11·78	7 40 23·58	8 45 57·82	9 21 4·49	10 53 9·8
28. Sat.	11 57 24·87	52 39	6 56 15·86	7 36 27·66	8 42 1·90	9 17 8·57	10 49 14·2
29. Sun.	11 57 15·94	52 58	6 52 19·93	7 32 31·74	8 38 5·99	9 13 12·66	10 45 18·6
30. Mon.	11 57 7·55	53 16	6 48 24·01	7 28 35·82	8 34 10·07	9 9 16·74	10 41 23·0

April 16 to 30.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Hydræ	Altitude	Declination
		h. m. s.	°	° ′
3	θ Ursæ Majoris	0 3 11·03	89 17 N	52 12 N
3	ε Leonis	0 17 19·65	62 49	24 18 N
1–2	α Leonis (*Regulus*)	— — —	51 3	12 32 N
2	γ^1 Leonis	0 51 32·83	58 57	20 26 N
4	ρ Leonis	1 4 38·54	48 25	9 54 N
2	α Ursæ Majoris	1 34 25·22	79 6 N	62 23 N
2–3	δ Leonis	— — —	59 41	21 10 N
2	β Leonis	— — —	53 44	15 13 N
3	ε Corvi	2 41 50·71	16 33	21 58 S
1	α^1 Crucis	2 57 49·42	(South)	62 27 S
2–3	β Corvi	3 5 54·70	15 46	22 45 S
3	δ Virginis	3 27 19·14	42 33	4 2 N
3–2	ε Virginis	3 33 56·56	50 6	11 35 N
1	α Virginis (*Spica*)	3 56 33·67	27 58	10 33 S
2	η Ursæ Majoris	4 20 23·62	88 25	49 54 N
3	η Bootis	4 26 33·59	57 30	18 59 N
1	α Bootis (*Arcturus*)	4 47 42·74	58 18	19 47 N

	° ′		h. m. s.
Capella (by daylight)	84 23	Subtract	4 13 6·71
Sirius ,,	21 57	,,	2 41 25·26

April 16 to 30.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Hydræ 30° 22′	α Leonis (Regulus) 51° 3′	δ Leonis 59° 41′	β Leonis 53° 44′	Polaris Lower Transit 50° 9′ (North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
16. Mon.	11 59 49·56	48 37	7 43 26·92	8 23 38·70	9 29 12·91	10 4 19·55	11 36 1·0
17. Tues.	11 59 35·19	48 58	7 39 31·00	8 19 42·78	9 25 17·00	10 0 23·64	11 32 25·2
18. Wed.	11 59 21·18	49 19	7 35 35·08	8 15 46·86	9 21 21·08	9 56 27·72	11 28 29·5
19. Thur.	11 59 7·55	49 40	7 31 39·15	8 11 50·94	9 17 25·16	9 52 31·81	11 24 33·8
20. Fri.	11 58 54·33	50 1	7 27 43·23	8 7 55·02	9 13 29·25	9 48 35·89	11 20 38·2
21. Sat.	11 58 41·52	50 21	7 23 47·31	8 3 59·10	9 9 33·33	9 44 39·98	11 16 42·7
22. Sun.	11 58 29·15	50 41	7 19 51·39	8 0 3·18	9 5 37·41	9 40 44·06	11 12 47·2
23. Mon.	11 58 17·22	51 2	7 15 55·47	7 56 7·26	9 1 41·49	9 36 48·15	11 8 51·7
24. Tues.	11 58 5·76	51 21	7 11 59·54	7 52 11·34	8 57 45·58	9 32 52·23	11 4 56·2
25. Wed.	11 57 54·78	51 41	7 8 3·62	7 48 15·42	8 53 49·66	9 28 56·32	11 1 0·8
26. Thur.	11 57 44·30	52 1	7 4 7·70	7 44 19·50	8 49 53·74	9 25 0·40	10 57 5·3
27. Fri.	11 57 34·33	52 20	7 0 11·78	7 40 23·58	8 45 57·82	9 21 4·49	10 53 9·8
28. Sat.	11 57 24·87	52 39	6 56 15·86	7 36 27·66	8 42 1·90	9 17 8·57	10 49 14·2
29. Sun.	11 57 15·94	52 58	6 52 19·93	7 32 31·74	8 38 5·99	9 13 12·66	10 45 18·6
30. Mon.	11 57 7·55	53 16	6 48 24·01	7 28 35·82	8 34 10·07	9 9 16·74	10 41 23·0

May 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of δ Leonis			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
2	β Leonis	—	—	—	53	44	15	13	N
1	α^1 Crucis	1	12	3·31	(South)		62	27	S
2–3	δ^2 Corvi	1	15	43·85	22	39	15	52	S
2–3	β Corvi	—	—	—	15	46	22	45	S
3	δ Virginis	1	41	33·28	42	33	4	2	N
3–2	ε Virginis	1	48	10·70	50	6	11	35	N
1	α Virginis (*Spica*)	—	—	—	27	58	10	33	S
2	η Ursæ Majoris	2	34	37·75	88	25	49	54	N
3	η Bootis	2	40	47·83	57	30	18	59	N
1	α Bootis (*Arcturus*)	3	1	57·01	58	18	19	47	N
2–3	ϵ^2 Bootis	3	31	25·30	66	5	27	34	N
2–3	α Libræ	3	35	56·90	22	58	15	33	S
2	β Ursæ Minoris	3	42	35·08	66	51	N 74	38	N
2	β Libræ	4	2	10·70	29	34	8	57	S

	°	′		h.	m.	s.
Capella (by daylight)	84	23	Subtract	5	58	5·68
Sirius ,,	21	57	,,	4	27	11·34

May 16 to 31.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	β Corvi 15° 46′	α Virginis (Spica) 27° 58′	η Ursæ Majoris 88° 24′	α Bootis (Arcturus) 58° 18′	Polaris Lower Transit 50° 9′(North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
16. Wed.	11 56 9·71	57 36	8 51 24·18	9 42 3·27	10 5 53·10	10 33 12·40	9 38 37·2
17. Thur.	11 56 10·84	57 50	8 47 28·26	9 38 7·36	10 1 57·18	10 29 16·49	9 34 42·0
18. Fri.	11 56 12·51	58 3	8 43 32·34	9 34 11·45	9 58 1·26	10 25 20·58	9 30 46·8
19. Sat.	11 56 14·73	58 16	8 39 36·43	9 30 15·54	9 54 5·34	10 21 24·67	9 26 51·7
20. Sun.	11 56 17·49	58 29	8 35 40·51	9 26 19·62	9 50 9·42	10 17 28·76	9 22 56·6
21. Mon.	11 56 20·79	58 41	8 31 44·59	9 22 23·71	9 46 13·50	10 13 32·85	9 19 1·5
22. Tues.	11 56 24·63	58 53	8 27 48·67	9 18 27·79	9 42 17·58	10 9 36·94	9 15 6·4
23. Wed.	11 56 28·99	59 5	8 23 52·75	9 14 31·88	9 38 21·65	10 5 41·02	9 11 11·3
24. Thur.	11 56 33·89	59 16	8 19 56·83	9 10 35·96	9 34 25·73	10 1 45·11	9 7 16·1
25. Fri.	11 56 39·31	59 27	8 16 0·91	9 6 40·05	9 30 29·80	9 57 49·19	9 3 20·9
26. Sat.	11 56 45·24	59 38	8 12 4·99	9 2 44·13	9 26 33·88	9 53 53·28	8 59 25·7
27. Sun.	11 56 51·67	59 48	8 8 9·08	8 58 48·22	9 22 37·96	9 49 57·37	8 55 30·5
28. Mon.	11 56 58·59	59 58	8 4 13·16	8 54 52·30	9 18 42·03	9 46 1·45	8 51 35·2
29. Tues.	11 57 5·99	60 8	8 0 17·24	8 50 56·39	9 14 46·11	9 42 5·54	8 47 40·0
30. Wed.	11 57 13·86	60 17	7 56 21·32	8 47 0·47	9 10 50·18	9 38 9·62	8 43 44·9
31. Thur.	11 57 22·19	60 26	7 52 25·40	8 43 4·56	9 6 54·26	9 34 13·71	8 39 49·8

May 16 to 31.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of β Corvi			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
3	δ Virginis	0	21	24·48	42	33	4	2	N
3–2	ε Virginis	0	28	1·89	50	6	11	35	N
1	α Virginis (*Spica*)	—	—	—	27	58	10	33	S
2	η Ursæ Majoris	—	—	—	88	25	49	54	N
3	η Bootis	1	20	39·06	57	30	18	59	N
1	β Centauri	1	27	8·38	(South)		59	49	S
1	α Bootis (*Arcturus*)	—	—	—	58	18	19	47	N
1	α^2 Centauri	2	3	7·31	(South)			1	S
2–3	ε^2 Bootis	2	11	16·57	66	5	27	34	N
2–3	α Libræ	2	15	48·20	22	58	15	33	S
2	β Ursæ Minoris	2	22	26·15	66	51 N	74	38	N
2	β Libræ	2	42	2·03	29	34	8	57	S
2	α Coronæ	3	0	59·93	65	38	27	7	N
2–3	α Serpentis	3	9	44·94	45	19	6	48	N
2	β^1 Scorpii	3	29	49·90	19	2	19	29	S
3	ζ Ophiuchi	3	39	22·72	35	8	3	23	S
3	γ Herculis	3	47	53·74	57	57	19	26	N

	°	′		h.	m.	s.
Capella (by daylight)	84	23	Subtract	7	19	1·42
Sirius ,,	21	57	,,	5	47	20·17

June 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Bootis (Arcturus) 58° 18′	α Libræ 22° 33′	β Libræ 29° 35′	α Coronæ 65° 38′	Polaris Lower transit 50° 9′ (North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1. Fri.	11 57 30·96	60 34	9 30 17·79	10 4 17·81	10 30 31·66	10 49 29·54	8 35 54·8
2. Sat.	11 57 40·15	60 42	9 26 21·88	10 0 21·90	10 26 35·75	10 45 33·63	8 31 59·8
3. Sun.	11 57 49·75	60 50	9 22 25·96	9 56 25·98	10 22 39·84	10 41 37·72	8 28 4·8
4. Mon.	11 57 59·73	60 57	9 18 30·04	9 52 30·07	10 18 43·93	10 37 41·81	8 24 9·9
5. Tues.	11 58 10·07	61 4	9 14 34·12	9 48 34·16	10 14 48·02	10 33 45·89	8 20 14·9
6. Wed.	11 58 20·75	61 10	9 10 38·21	9 44 38·25	10 10 52·11	10 29 49·98	8 16 19·8
7. Thur.	11 58 31·73	61 16	9 6 42·29	9 40 42·34	10 6 56·20	10 25 54·07	8 12 24·7
8. Fri.	11 58 42·99	61 22	9 2 46·37	9 36 46·42	10 3 0·29	10 21 58·16	8 8 29·6
9. Sat.	11 58 54·51	61 27	8 58 50·46	9 32 50·51	9 59 4·38	10 18 2·25	8 4 34·5
10. Sun.	11 59 6·26	61 32	8 54 54·54	9 28 54·60	9 55 8·47	10 14 6·34	8 0 39·3
11. Mon.	11 59 18·23	61 36	8 50 58·62	9 24 58·69	9 51 12·56	10 10 10·42	7 56 44·2
12. Tues.	11 59 30·38	61 40	8 47 2·70	9 21 2·77	9 47 16·65	10 6 14·51	7 52 49·2
13. Wed.	11 59 42·71	61 44	8 43 6·78	9 17 6·86	9 43 20·73	10 2 18·59	7 48 54·2
14. Thur.	11 59 55·18	61 47	8 39 10·86	9 13 10·94	9 39 24·82	9 58 22·68	7 44 59·3
15. Fri.	12 0 7·78	61 50	8 35 14·94	9 9 15·03	9 35 28·91	9 54 26·76	7 41 4·4

June 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Bootis	Altitude	Declination
		h. m. s.	° ′	° ′
1	α^2 Centauri	0 21 19·00	(South)	60 21 S
2–3	ϵ^2 Bootis	0 29 28·34	66 5	27 34 N
2–3	α Libræ	— — —	22 58	15 33 S
2	β Ursæ Minoris	0 40 37·22	66 51 N	74 38 N
2	β Libræ	— — —	29 34	8 57 S
2	α Coronæ	— — —	65 38	27 7 N
2–3	α Serpentis	1 27 56·87	45 19	6 48 N
2	β^1 Scorpii	— — —	19 2	19 29 S
3	δ Ophiuchi	1 57 34·71	35 8	3 23 S
3	γ Herculis	2 6 5·71	57 57	19 26 N
1–2	α Scorpii (*Antares*) . . .	2 11 34·30	12 21	26 10 S
3–2	ζ Ophiuchi	2 20 1·39	28 11	10 20 S
3–2	ζ Herculis	2 26 9·41	70 20	31 49 N
2–3	η Ophiuchi	2 52 53·22	22 56	15 35 S
3–4	α^1 Herculis	2 58 30·46	53 3	14 32 N
3–2	β Draconis	3 16 55·93	89 5 N	52 24 N
2	α Ophiuchi	3 18 38·58	51 10	12 39 N
3	β Ophiuchi	3 26 48·70	43 8	4 37 N

	° ′		h. m. s.	
Capella by (daylight)	84 23	Subtract	9 0 49·38	
Sirius ,,	21 57	,,	7 29 8·40	

June 16 to 30.

Mean Time of Transit at Greenwich.

1883	The Sun			Sun's Alt.		α Libræ 22° 23′			β Libræ 29° 35′			α Coronæ 65° 38′			β¹ Scorpii 19° 2′			α Scorpii (Antares) 12° 21′		
	h.	m.	s	°	′	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
16. Sat.	12	0	20·48	61	52	9	5	19·12	9	31	33·00	9	50	30·85	10	19	20·99	10	42	53·40
17. Sun.	12	0	33·27	61	54	9	1	23·20	9	27	37·09	9	46	34·93	10	15	25·08	10	38	57·50
18. Mon.	12	0	46·13	61	56	8	57	27·29	9	23	41·17	9	42	39·02	10	11	29·18	10	35	1·59
19. Tues.	12	0	59·03	61	57	8	53	31·37	9	19	45·26	9	38	43·10	10	7	33·27	10	31	5·69
20. Wed.	12	1	11·95	61	58	8	49	35·46	9	15	49·35	9	34	47·19	10	3	37·36	10	27	9·78
21. Thur.	12	1	24·88	61	58	8	45	39·54	9	11	53·43	9	30	51·27	9	59	41·45	10	23	13·87
22. Fri.	12	1	37·80	61	58	8	41	43·63	9	7	57·52	9	26	55·35	9	55	45·54	10	19	17·96
23. Sat.	12	1	50·67	61	58	8	37	47·71	9	4	1·60	9	22	59·43	9	51	49·62	10	15	22·05
24. Sun.	12	2	3·49	61	57	8	33	51·79	9	0	5·69	9	19	3·51	9	47	53·71	10	11	26·14
25. Mon.	12	2	16·22	61	55	8	29	55·87	8	56	9·77	9	15	7·60	9	43	57·80	10	7	30·23
26. Tues.	12	2	28·86	61	54	8	25	59·96	8	52	13·85	9	11	11·68	9	40	1·89	10	3	34·32
27. Wed.	12	2	41·38	61	51	8	22	4·04	8	48	17·94	9	7	15·76	9	36	5·98	9	59	38·41
28. Thur.	12	2	53·77	61	49	8	18	8·12	8	44	22·02	9	3	19·84	9	32	10·06	9	55	42·50
29. Fri.	12	3	5·99	61	46	8	14	12·21	8	40	26·11	8	59	23·92	9	28	14·15	9	51	46·59
30. Sat.	12	3	18·03	61	43	8	10	16·29	8	36	30·19	8	55	28·00	9	24	18·24	9	47	50·68

June 16 to 30.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Librae			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
2	β Ursæ Minoris	0	6	36·67	66	51	74	38	N
2	β Librae	—	—	—	29	34	8	57	S
2	α Coronæ	—	—	—	65	38	27	7	N
2–3	α Serpentis	0	53	56·84	45	19	6	48	N
2	β^1 Scorpii	—	—	—	19	2	19	29	S
3	δ Ophiuchi	1	23	34·72	35	8	3	23	S
3	γ Herculis	1	32	5·70	57	57	19	26	N
1–2	α Scorpii (*Antares*)	—	—	—	12	21	26	10	S
3–2	ζ Ophiuchi	1	46	1·42	28	11	10	20	S
3–2	ζ Herculis	1	52	9·40	70	20	31	49	N
2–3	η Ophiuchi	2	18	53·28	22	56	15	35	S
3–4	α^1 Herculis	2	24	30·49	53	3	14	32	N
3–2	β Draconis	2	42	55·95	89	5	52	24	N
2	α Ophiuchi	2	44	38·64	51	10	12	39	N
3	β Ophiuchi	2	52	48·77	43	8	4	37	N
2–3	γ Draconis	3	8	57·71	89	59	51	30	N
3	η Serpentis	3	30	16·53	35	36	2	55	S
1	α Lyræ (*Vega*)	3	47	56·62	77	12	38	41	N

	°	′		h.	m.	s.
Capella (by daylight)	84	23	Subtract	9	34	49·22
Sirius ,,	21	57	,,	8	3	8·39
Arcturus ,,	58	18	,,	0	34	0·11

July 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	β Libræ 29° 34′	α Coronæ 65° 38′	β¹ Scorpii 19° 2′	α Scorpii (Antares) 12° 21′	α¹ Herculis 53° 3′
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1. Sun.	12 3 29·87	61 39	8 32 34·27	8 51 32·08	9 20 22·32	9 43 54·77	10 30 50·96
2. Mon.	12 3 41·48	61 35	8 28 38·35	8 47 36·16	9 16 26·41	9 39 58·85	10 26 55·05
3. Tues.	12 3 52·82	61 30	8 24 42·44	8 43 40·24	9 12 30·49	9 36 2·94	10 22 59·13
4. Wed.	12 4 3·88	61 25	8 20 46·52	8 39 44·32	9 8 34·58	9 32 7·02	10 19 3·22
5. Thur.	12 4 14·62	61 20	8 16 50·60	8 35 48·39	9 4 38·66	9 28 11·11	10 15 7·31
6. Fri.	12 4 25·03	61 14	8 12 54·68	8 31 52·47	9 0 42·75	9 24 15·20	10 11 11·40
7. Sat.	12 4 35·07	61 8	8 8 58·76	8 27 56·55	8 56 46·83	9 20 19·28	10 7 15·49
8. Sun.	12 4 44·73	61 1	8 5 2·85	8 24 0·63	8 52 50·92	9 16 23·37	10 3 19·57
9. Mon.	12 4 53·98	60 54	8 1 6·93	8 20 4·71	8 48 55·00	9 12 27·45	9 59 23·66
10. Tues.	12 5 2·80	60 47	7 57 11·01	8 16 8·79	8 44 59·09	9 8 31·54	9 55 27·75
11. Wed.	12 5 11·19	60 39	7 53 15·09	8 12 12·87	8 41 3·17	9 4 35·62	9 51 31·83
12. Thur.	12 5 19·12	60 31	7 49 19·17	8 8 16·94	8 37 7·25	9 0 39·70	9 47 35·92
13. Fri.	12 5 26·57	60 22	7 45 23·25	8 4 21·02	8 33 11·33	8 56 43·79	9 43 40·00
14. Sat.	12 5 33·54	60 14	7 41 27·33	8 0 25·09	8 29 15·41	8 52 47·87	9 39 44·09
15. Sun.	12 5 40·01	60 4	7 37 31·40	7 56 29·17	8 25 19·49	8 48 51·95	9 35 48·17

July 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of β Librae			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
2	α Coronæ	—	—	—	65	38	27	7	N
2–3	α Serpentis	0	27	42·97	45	19	6	48	N
2	β^1Scorpii	—	—	—	19	2	19	29	S
3	δ Ophiuchi	0	57	20·90	35	8	3	23	S
3	γ Herculis	1	5	51·84	57	57	19	26	N
1–2	α Scorpii (*Antares*)	—	—	—	12	21	26	10	S
3–2	ζ Ophiuchi	1	19	47·64	28	11	10	20	S
3–2	ζ Herculis	1	25	55·53	70	20	31	49	N
2–3	η Ophiuchi	1	52	39·56	22	56	15	35	S
3–4	α^1Herculis	—	—	—	53	3	14	32	N
3–2	β Draconis	2	16	42·06	89	5 N	52	24	N
2	α Ophiuchi	2	18	24·92	51	10	12	39	N
3	β Ophiuchi	2	26	35·08	43	8	4	37	N
2–3	γ Draconis	2	42	43·90	89	59 N	51	30	N
3	η Serpentis	3	4	2·92	35	36	2	55	S
3	λ Sagittarii	3	9	32·24	13	2	25	29	S
1	α Lyræ (*Vega*)	3	21	42·97	77	12	38	41	N

	°	′		h.	m.	s.
Capella (by daylight)	84	23	Subtract	10	1	2·47
Sirius ,,	21	57	,,	8	29	21·99
Arcturus ,,	58	18	,,	1	0	14·10

July 16 to 31.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Scorpii (Antares) 12° 21′	α¹ Herculis 53° 3′	α Ophiuchi 51° 10′	γ Draconis 89° 59′ (North)	α Lyræ (Vega) 77° 12′
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
16. Mon.	12 5 45·97	59 55	8 44 56·03	9 31 52·25	9 52 0·45	10 16 19·38	10 55 18·50
17. Tues.	12 5 51·40	59 45	8 41 0·11	9 27 56·34	9 48 4·53	10 12 23·46	10 51 22·59
18. Wed.	12 5 56·31	59 34	8 37 4·20	9 24 0·42	9 44 8·62	10 8 27·53	10 47 26·68
19. Thurs.	12 6 0·67	59 24	8 33 8·28	9 20 4·51	9 40 12·70	10 4 31·61	10 43 30·76
20. Fri.	12 6 4·48	59 13	8 29 12·36	9 16 8·59	9 36 16·79	10 0 35·69	10 39 34·85
21. Sat.	12 6 7·74	59 1	8 25 16·44	9 12 12·67	9 32 20·87	9 56 39·76	10 35 38·93
22. Sun.	12 6 10·44	58 50	8 21 20·52	9 8 16·75	9 28 24 96	9 52 43·84	10 31 43·02
23. Mon.	12 6 12·58	58 38	8 17 24·60	9 4 20·83	9 24 29 04	9 48 47·91	10 27 47·10
24. Tues.	12 6 14·16	58 25	8 13 28·68	9 0 24·91	9 20 33·12	9 44 51·99	10 23 51·18
25. Wed.	12 6 15·17	58 12	8 9 32·76	8 56 28·99	9 16 37·20	9 40 56·06	10 19 55·26
26. Thur.	12 6 15·61	57 59	8 5 36·84	8 52 33·08	9 12 41·29	9 37 0·13	10 15 59·35
27. Fri.	12 6 15·48	57 46	8 1 40·92	8 48 37·16	9 8 45·37	9 33 4·21	10 12 3·43
28. Sat.	12 6 14·78	57 32	7 57 45·00	8 44 41·24	9 4 49·45	9 29 8·28	10 8 7·51
29. Sun.	12 6 13·51	57 18	7 53 49·08	8 40 45·32	9 0 53·54	9 25 12·36	10 4 11·60
30. Mon.	12 6 11·65	57 4	7 49 53·16	8 36 49·40	8 56 57·62	9 21 16·43	10 0 15·68
31. Tues.	12 6 9·20	56 49	7 45 57·24	8 32 53·48	8 53 1·70	9 17 20·50	9 56 19·76

July 16 to 31.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Scorpii			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
3–2	ζ Ophiuchi.	0	8	27·13	28	11	10	20	S
3–2	ζ Herculis	0	14	34·97	70	20	31	49	N
2–3	η Ophiuchi.	0	41	19·06	22	56	15	35	S
3–4	α^1 Herculis	—	—	—	53	3	14	32	N
3–2	β Draconis	1	5	21·45	89	5 N	52	24	N
2	α Ophiuchi.	—	—	—	51	10	12	39	N
3	β Ophiuchi	1	15	14·61	43	8	4	37	N
2–3	γ Draconis.	—	—	—	89	59 N	51	30	N
3	η Serpentis.	1	52	42·48	35	36	2	55	S
3	λ Sagittarii.	1	58	11·82	13	2	25	29	S
1	α Lyræ (*Vega*)	—	—	—	77	12	38	41	N
3	ζ Aquilæ	2	37	21·51	52	13	13	42	N
3–4	δ Aquilæ	2	56	52·50	41	24	2	53	N
3	γ Aquilæ	3	17	54·98	48	51	10	20	N
3	α Aquilæ (*Altair*) . . .	3	22	16·92	47	5	8	34	N
3	θ Aquilæ	3	42	25·25	37	21	1	10	S
2	α Pavonis	3	53	32·40	(South)		57	6	S
2–1	α Cygni	4	14	30·51	83	23	44	52	N
3	ζ Cygni	4	44	56·20	68	16	29	45	N

		° ′		h. m. s.
Capella (by daylight)		84 23	Subtract	11 12 22·61
Sirius	,,	21 57	,,	9 40 42·30
Arcturus	,,	58 18	,,	2 11 34·70

August 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α^1 Herculis 53° 3′	α Ophiuchi 51° 10′	η Serpentis 35° 36′	α Lyræ (Vega) 77° 12′	ζ Aquilæ 52° 13′
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1. Wed.	12 6 6·15	56 34	8 28 57·56	8 49 5·78	9 34 43·88	9 52 23·84	10 19 22·95
2. Thur.	12 6 2·51	56 19	8 25 1·64	8 45 9·86	9 30 47·96	9 48 27·92	10 15 27·04
3. Fri.	12 5 58·27	56 2	8 21 5·72	8 41 13·94	9 26 52·05	9 44 32·00	10 11 31·13
4. Sat.	12 5 53·41	55 48	8 17 9·80	8 37 18·02	9 22 56·13	9 40 36·08	10 7 35·21
5. Sun.	12 5 47·95	55 32	8 13 13·88	8 33 22·10	9 19 0·21	9 36 40·16	10 3 39·30
6. Mon.	12 5 41·88	55 15	8 9 17·96	8 29 26·18	9 15 4·30	9 32 44·24	9 59 43·39
7. Tues.	12 5 35·21	54 59	8 5 22·04	8 25 30·26	9 11 8·38	9 28 48·32	9 55 47·48
8. Wed.	12 5 27·93	54 42	8 1 26·12	8 21 34·34	9 7 12·47	9 24 52·40	9 51 51·56
9. Thur.	12 5 20·05	54 25	7 57 30·20	8 17 38·42	9 3 16·55	9 20 56·48	9 47 55·65
10. Fri.	12 5 11·58	54 7	7 53 34·28	8 13 42·50	8 59 20·63	9 17 0·56	9 43 59·73
11. Sat.	12 5 2·53	53 50	7 49 38·35	8 9 46·58	8 55 24·71	9 13 4·63	9 40 3·82
12. Sun.	12 4 52·89	53 32	7 45 42·43	8 5 50·66	8 51 28·80	9 9 8·71	9 36 7·90
13. Mon.	12 4 42·68	53 14	7 41 46·51	8 1 54·74	8 47 32·88	9 5 12·79	9 32 11·99
14. Tues.	12 4 31·90	52 55	7 37 50·58	7 57 58·81	8 43 36·96	9 1 16·86	9 28 16·07
15. Wed.	12 4 20·57	52 37	7 33 54·66	7 54 2·89	8 39 41·04	8 57 20·94	9 24 20·15

August 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α^1 Herculis.			Altitude			Declination		
		h.	m.	s.	°	′		°	′	
3–2	β Draconis	0	18	24·97	89	5	N	52	24	N
2	α Ophiuchi	—	—	—	51	10		12	39	N
3	β Ophiuchi	0	28	18·43	43	8		4	37	N
2–3	γ Draconis	0	44	26·93	89	59	N	51	30	N
3	η Serpentis	—	—	—	35	36		2	55	S
3	λ Sagittarii	1	11	15·73	13	2		25	29	S
1	α Lyræ (*Vega*)	—	—	—	77	12		38	41	N
3	ζ Aquilæ	—	—	—	52	13		13	42	N
3–4	δ Aquilæ	2	9	56·49	41	24		2	53	N
3	γ Aquilæ	2	30	58·99	48	51		10	20	N
1–2	α Aquilæ (*Altair*) . . .	2	35	20·95	47	5		8	34	N
3	θ Aquilæ	2	55	29·31	37	21		1	10	S
2	α Pavonis	3	6	36·56	(South)			57	6	S
2–1	α Cygni	3	27	34·58	83	23		44	52	N
3	ζ Cygni	3	58	0·36	68	16		29	45	N
3–2	α Cephei	4	5	49·74	79	23	N	62	6	N
3	β Aquarii	4	15	24·08	32	26		6	5	S
2–3	ϵ Pegasi	4	28	24·42	47	52		9	21	N

		°	′		h.	m.	s.
Capella (by daylight)		84	23	Subtract	11	59	17·93
Sirius	,,	21	57	,,	10	27	37·96
Arcturus	,,	58	18	,,	2	58	31·03

September 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Lyræ (Vega) 77° 12′	α Aquilæ (Altair) 47° 5′	θ Aquilæ 37° 21′	α Cygni 83° 23′	ε Pegasi 47° 52′
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1. Sat.	11 59 57·16	46 50	7 50 30·19	9 2 25·12	9 22 33·54	9 54 38·73	10 55 28·82
2. Sun.	11 59 38·34	46 28	7 46 34·26	8 58 29·20	9 18 37·63	9 50 42·81	10 51 32·91
3. Mon.	11 59 19·23	46 6	7 42 38·33	8 54 33·28	9 14 41·71	9 46 46·88	10 47 37·00
4. Tues.	11 58 59·85	45 44	7 38 42·40	8 50 37·37	9 10 45·79	9 42 50·96	10 43 41·10
5. Wed.	11 58 40·23	45 22	7 34 46·47	8 46 41·45	9 6 49·88	9 38 55·04	10 39 45·19
6. Thur.	11 58 20·36	45 0	7 30 50·54	8 42 45·53	9 2 53·96	9 34 59·12	10 35 49·28
7. Fri.	11 58 0·27	44 37	7 26 54·61	8 38 49·61	8 58 58·05	9 31 3·20	10 31 53·37
8. Sat.	11 57 39·97	44 15	7 22 58·68	8 34 53·69	8 55 2·13	9 27 7·28	10 27 57·46
9. Sun.	11 57 19·48	43 52	7 19 2·75	8 30 57·77	8 51 6·21	9 23 11·36	10 24 1·55
10. Mon.	11 56 58·82	43 30	7 15 6·82	8 27 1·85	8 47 10·29	9 19 15·43	10 20 5·64
11. Tues.	11 56 38·02	43 7	7 11 10·89	8 23 5·93	8 43 14·37	9 15 19·51	10 16 9·73
12. Wed.	11 56 17·08	42 44	7 7 14·96	8 19 10·01	8 39 18·45	9 11 23·58	10 12 13·82
13. Thur.	11 55 56·02	42 21	7 3 19·02	8 15 14·09	8 35 22·53	9 7 27·66	10 8 17·90
14. Fri.	11 55 34·87	41 58	6 59 23·09	8 11 18·17	8 31 26·62	9 3 31·74	10 4 21·99
15. Sat.	11 55 13·65	41 35	6 55 27·16	8 7 22·25	8 27 30·70	8 59 35·81	10 0 26·08

September 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Lyræ			Altitude		Declination		
		h.	m.	s.	°	′	°	′	
3	ζ Aquilæ	0	26	59·41	52	13	13	42	N
3–4	δ Aquilæ	0	46	30·52	41	24	2	53	N
3	γ Aquilæ	1	7	33·04	48	51	10	20	N
1–2	α Aquilæ (*Altair*)	—	—	—	47	5	8	34	N
3	θ Aquilæ	—	—	—	37	21	1	10	S
2	α Pavonis	1	43	10·59	(South)		57	6	S
2–1	α Cygni	—	—	—	83	23	44	52	N
3	ζ Cygni	2	34	34·60	68	16	29	45	N
3–2	α Cephei	2	42	23·74	79	23 N	62	6	N
3	β Aquarii	2	51	58·44	32	26	6	5	S
2–3	ε Pegasi	—	—	—	47	52	9	21	N
3	α Aquarii	3	26	15·31	37	38	0	53	S
3–4	ζ Pegasi	4	2	0·64	48	45	10	14	N
1–2	α Piscis Austr. (*Fomalhaut*)	4	17	31·64	8	17	30	14	S
2	α Pegasi (*Markab*)	4	25	15·34	53	6	14	35	N
3–4	γ Cephei	5	0	52·34	64	30 N	76	59	N

	°	′		h.	m.	s.
Sirius (by daylight)	21	57	Subtract	11	51	2·94
Arcturus ,,	58	18	,,	4	21	57·16

September 16 to 30.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Lyræ (Vega) 77° 12′	α Cygni 83° 23′	α Cephei 79° 23′ (North)	ε Pegasi 47° 52′	α Aquarii 37° 38′
	h. m. s.	° ′	h. m. s.	h. m s.	h. m. s.	h. m. s.	h. m. s.
16. Sun.	11 54 52·38	41 12	6 51 31·23	8 55 39·89	9 33 54·97	9 56 30·17	10 17 46·69
17. Mon.	11 54 31·08	40 49	6 47 35·30	8 51 43·96	9 29 59·04	9 52 34·26	10 13 50·78
18. Tues.	11 54 9·79	40 25	6 43 39·37	8 47 48·04	9 26 3·11	9 48 38·35	10 9 54·87
19. Wed.	11 53 48·53	40 2	6 39 43·44	8 43 52·11	9 22 7·17	9 44 42·43	10 5 58·96
20. Thur.	11 53 27·33	39 39	6 35 47·51	8 39 56·18	9 18 11·24	9 40 46·52	10 2 3·05
21. Fri.	11 53 6·21	39 15	6 31 51·57	8 36 0·26	9 14 15·30	9 36 50·60	9 58 7·13
22. Sat.	11 52 45·19	38 52	6 27 55·64	8 32 4·33	9 10 19·37	9 32 54·69	9 54 11 22
23. Sun.	11 52 24·30	38 29	6 23 59·71	8 28 8·40	9 6 23·43	9 28 58·77	9 50 15·31
24. Mon.	11 52 3·55	38 5	6 20 3·78	8 24 12·47	9 2 27·49	9 25 2·86	9 46 19·40
25. Tues.	11 51 42·96	37 42	6 16 7·85	8 20 16·54	8 58 31·56	9 21 6·94	9 42 23·49
26. Wed.	11 51 22·55	37 18	6 12 11·91	8 16 20·62	8 54 35·62	9 17 11·03	9 38 27·57
27. Thur.	11 51 2·34	36 55	6 8 15·98	8 12 24·69	8 50 39·69	9 13 15·11	9 34 31·66
28. Fri.	11 50 42·34	36 32	6 4 20·05	8 8 28·76	8 46 43·75	9 9 19·20	9 30 35·75
29. Sat.	11 50 22·57	36 8	6 0 24·12	8 4 32·83	8 42 47·81	9 5 23·28	9 26 39·83
30. Sun.	11 50 3·06	35 45	5 56 28·19	8 0 36·90	8 38 51·87	9 1 27·36	9 22 43·92

September 16 to 30.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Lyræ	Altitude	Declination
		h. m. s.	° ′	° ′
3	ζ Aquilæ	0 26 59·49	52 13	13 42 N
3–4	δ Aquilæ	0 46 30·62	41 24	2 53 N
3	γ Aquilæ	1 7 33·14	48 51	10 20 N
1–2	α Aquilæ (*Altair*) . . .	1 11 55·12	47 5	8 34 N
3	θ Aquilæ	1 32 3·58	37 21	1 10 S
2	α Pavonis	1 43 10·61	(South)	57 6 S
2–1	α Cygni	— — —	83 23	44 52 N
3	ζ Cygni	2 34 34·74	68 16	29 45 N
3–2	α Cephei	— — —	79 23 N	62 6 N
3	β Aquarii	2 51 58·63	32 26	6 5 S
2–3	ϵ Pegasi	— — —	47 52	9 21 N
3	α Aquarii	— — —	37 38	0 53 S
3–4	ζ Pegasi	4 2 0·89	48 45	10 14 N
1–2	α Piscis Austr. (*Fomalhaut*) .	4 17 31·90	8 17	30 14 S
2	α Pegasi (*Markab*) . . .	4 25 15·61	53 6	14 35 N
3–4	γ Cephei	5 0 52·67	64 30 N	76 59 N
2	α Andromedæ	5 28 30·08	66 58	28 27 N
3–2	γ Pegasi (*Algenib*) . . .	5 33 20·27	53 3	14 32 N

	° ′		h. m. s.
Sirius (by daylight)	21 57	Subtract	11 51 2·42
Arcturus ,,	58 18	,,	4 21 57·03

October 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Lyræ (Vega) 77° 12′	ε Pegasi 47° 52′	α Aquarii 37° 38′	α Pegasi (Markab) 53° 6′	Polaris 52° 48′ (North)
							Midnight
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1. Mon.	11 49 43·82	35 22	5 52 32·25	8 57 31·45	9 18 48·00	10 17 48·17	12 35 49·9
2. Tues.	11 49 24·87	34 58	5 48 36·32	8 53 35·53	9 14 52·09	10 13 52·26	12 31 54·3
3. Wed.	11 49 6·22	34 35	5 44 40·39	8 49 39·61	9 10 56·17	10 9 56·34	12 27 58·7
4. Thur.	11 48 47·89	34 12	5 40 44·46	8 45 43·69	9 7 0·25	10 6 0·43	12 24 3·1
5. Fri	11 48 29·91	33 49	5 36 48·53	8 41 47·77	9 3 4·34	10 2 4·52	12 20 7·5
6. Sat.	11 48 12·28	33 26	5 32 52·59	8 37 51·86	8 59 8·42	9 58 8·61	12 16 11·9
7. Sun.	11 47 55·03	33 3	5 28 56·66	8 33 55·94	8 55 12·51	9 54 12·70	12 12 16·3
8. Mon.	11 47 38·17	32 40	5 25 0·73	8 30 0·02	8 51 16·59	9 50 16·79	12 8 20·5
9. Tues.	11 47 21·72	32 17	5 21 4·80	8 26 4·10	8 47 20·67	9 46 20·87	12 4 24·8
10. Wed.	11 47 5·70	31 54	5 17 8·87	8 22 8·18	8 43 24·75	9 42 24·96	12 0 28·9 (P.M.)
11. Thur.	11 46 50·12	31 31	5 13 12·93	8 18 12·26	8 39 28·83	9 38 29·04	11 56 33·0
12. Fri.	11 46 35·00	31 9	5 9 17·00	8 14 16·34	8 35 32·91	9 34 33·13	11 52 37·1
13. Sat.	11 46 20·37	30 46	5 5 21·07	8 10 20·41	8 31 36·99	9 30 37·21	11 48 41·2
14. Sun.	11 46 6·25	30 24	5 1 25·14	8 6 24·49	8 27 41·08	9 26 41·30	11 44 45·3
15. Mon.	11 45 52·66	30 1	4 57 29·21	8 2 28·57	8 23 45·16	9 22 45·38	11 40 49·5

October 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Lyræ	Altitude	Declination
		h. m. s.	° ′	° ′
3	ζ Aquilæ	0 26 59·63	52 13	13 42 N
3–4	δ Aquilæ	0 46 30·79	41 24	2 53 N
3	γ Aquilæ	1 7 33·31	48 51	10 20 N
1–2	α Aquilæ (*Altair*)	1 11 55·30	47 5	8 34 N
3	θ Aquilæ	1 32 3·79	37 21	1 10 S
2	α Pavonis	1 43 10·53	(South)	57 6 S
2–1	α Cygni	2 4 8·73	83 23	44 52 N
3	ζ Cygni	2 34 34·95	68 16	29 45 N
3–2	α Cephei	2 42 23·62	79 23 N	62 6 N
3	β Aquarii	2 51 58·93	32 26	6 5 S
2–3	ε Pegasi	— — —	47 52	9 21 N
3	α Aquarii	— — —	37 38	0 53 S
3–4	ζ Pegasi	4 2 1·30	48 45	10 14 N
1–2	α Piscis Austr. (*Fomalhaut*)	4 17 32·32	8 17	30 14 S
2	α Pegasi (*Markab*)	— — —	53 6	14 35 N
3–4	γ Cephei	5 0 52·91	64 30 N	76 59 N
2	α Andromedæ	5 28 30·67	66 58	28 27 N
3–2	γ Pegasi (*Algenib*)	5 33 21·86	53 3	14 32 N
2–3	α Cassiopeiæ	5 59 59·03	85 35 N	55 54 N
2–3	β Andromedæ	6 29 11·73	73 31	35 0 N

	° ′		h. m. s.
Arcturus (by daylight)	58 18	Subtract	4 21 56·66

October 16 to 31.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Aquilæ (Altair) 47° 5′	α Aquarii 37° 38′	α Pegasi (Markab) 53° 6′	α Andromedæ 66° 58′	Polaris 52° 48′ (North)
		° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
16. Tues.	11 45 39·62	29 39	6 5 28·63	8 19 49·24	9 18 49·47	10 22 4·13	11 36 53·7
17. Wed.	11 45 27·16	29 17	6 1 32·70	8 15 53·32	9 14 53·55	10 18 8·22	11 32 57·9
18. Thur.	11 45 15·30	28 55	5 57 36·78	8 11 57·40	9 10 57·64	10 14 12·31	11 29 2·2
19. Fri.	11 45 4·06	28 33	5 53 40·86	8 8 1·48	9 7 1·72	10 10 16·40	11 25 6·4
20. Sat.	11 44 53·47	28 12	5 49 44·93	8 4 5·56	9 3 5·81	10 6 20·48	11 21 10·6
21. Sun.	11 44 43·54	27 50	5 45 49·01	8 0 9·64	8 59 9·89	10 2 24·57	11 17 14·7
22. Mon.	11 44 34·29	27 29	5 41 53·08	7 56 13·72	8 55 13·97	9 58 28·66	11 13 18·7
23. Tues.	11 44 25·73	27 8	5 37 57·16	7 52 17·80	8 51 18·05	9 54 32·74	11 9 22·6
24. Wed.	11 44 17·88	26 47	5 34 1·24	7 48 21·88	8 47 22·14	9 50 36·83	11 5 26·6
25. Thur.	11 44 10·74	26 26	5 30 5·31	7 44 25·96	8 43 26·22	9 46 40·92	11 1 30·5
26. Fri.	11 44 4·34	26 5	5 26 9·39	7 40 30·04	8 39 30·30	9 42 45·01	10 57 34·4
27. Sat.	11 43 58·68	25 45	5 22 13·46	7 36 34·12	8 35 34·39	9 38 49·09	10 53 38·3
28. Sun.	11 43 53·77	25 25	5 18 17·54	7 32 38·20	8 31 38·47	9 34 53·18	10 49 42·3
29. Mon.	11 43 49·63	25 5	5 14 21·62	7 28 42·28	8 27 42·55	9 30 57·26	10 45 46·2
30. Tues.	11 43 46·27	24 45	5 10 25·69	7 24 46·36	8 23 46·63	9 27 1·35	10 41 50·3
31. Wed.	11 43 43·68	24 25	5 6 29·77	7 20 50·43	8 19 50·71	9 23 5·43	10 37 54·3

October 16 to 31.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Aquilæ	Altitude	Declination
		h. m. s.	° ′	° ′
3	θ Aquilæ	0 20 8·49	37 21	1 10 S
2	α Pavonis	0 31 15·06	(South)	57 6 S
2–1	α Cygni	0 52 13·34	83 23	44 52 N
3	ζ Cygni	1 22 39·65	68 16	29 45 N
3–?	α Cephei	1 30 28·12	79 23 N	62 6 N
3	β Aquarii	1 40 3·67	32 26	6 5 S
2–3	ε Pegasi	1 53 4·04	47 52	9 21 N
3	α Aquarii	— — —	37 38	0 53 S
3–4	ζ Pegasi	2 50 6·08	48 45	10 14 N
1–2	α Piscis Austr. (*Fomalhaut*) .	3 5 37·10	8 17	30 14 S
2	α Pegasi (*Markab*) . . .	— — —	53 6	14 35 N
3–4	γ Cephei	3 48 57·42	64 30 N	76 59 N
2	α Andromedæ	— — —	66 58	28 27 N
3–2	γ Pegasi (*Algenib*) . . .	4 21 26·73	53 3	14 32 N
2–3	α Cassiopeiæ	4 48 3·91	85 35 N	55 54 N
2	β Ceti	4 51 51·64	19 53	18 38 S
2–3	β Andromedæ	5 17 16·65	73 31	35 0 N
3	θ Ceti	5 32 12·66	29 44	8 47 S
1	α Eridani (*Achernar*) . . .	5 47 2·72	(South)	57 50 S
3–2	β Arietis	6 2 8·45	58 45	20 14 N
2	α Arietis	6 14 30·68	61 26	22 55 N

		° ′		h. m. s.
Arcturus	(by daylight)	58 18	Subtract	5 33 51·79
α Lyræ (*Vega*)	,,	77 12	,,	1 11 55·37

November 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	α Cygni 83° 23′	α Cephei 79° 23′ (North)	α Andromedæ 66° 58′	α Cassiopeiæ 85° 35′ (North)	Polaris 52° 48′ (North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
1. Thur.	11 43 41·89	24 6	5 54 47·04	6 33 1·61	9 19 9·52	9 50 37·89	10 33 58·3
2. Fri.	11 43 40·89	23 47	5 50 51·11	6 29 5·66	9 15 13·60	9 46 41·97	10 30 2·3
3. Sat.	11 43 40·69	23 28	5 46 55·18	6 25 9·71	9 11 17·68	9 42 46·05	10 26 6·2
4. Sun.	11 43 41·30	23 9	5 42 59·24	6 21 13·76	9 7 21·77	9 38 50·13	10 22 10·1
5. Mon.	11 43 42·72	22 51	5 39 3·31	6 17 17·81	9 3 25·85	9 34 54·22	10 18 14·0
6. Tues.	11 43 44·94	22 33	5 35 7·37	6 13 21·86	8 59 29·94	9 30 58·30	10 14 17·8
7. Wed.	11 43 47·98	22 15	5 31 11·44	6 9 25·91	8 55 34·02	9 27 2·38	10 10 21·5
8. Thur.	11 43 51·84	21 57	5 27 15·50	6 5 29·96	8 51 38·10	9 23 6·46	10 6 25·2
9. Fri.	11 43 56·52	21 40	5 23 19·57	6 1 34·01	8 47 42·18	9 19 10·53	10 2 28·9
10. Sat.	11 44 2·02	21 23	5 19 23·63	5 57 38·05	8 43 46·26	9 15 14·61	9 58 32·5
11. Sun.	11 44 8·35	21 6	5 15 27·70	5 53 42·10	8 39 50·34	9 11 18·68	9 54 36·3
12. Mon.	11 44 15·51	20 50	5 11 31·76	5 49 46·15	8 35 54·42	9 7 22·76	9 50 40·0
13. Tues.	11 44 23·51	20 33	5 7 35·83	5 45 50·20	8 31 58·51	9 3 26·84	9 46 43·8
14. Wed.	11 44 32·36	20 18	5 3 39·89	5 41 54·25	8 28 2·59	8 59 30·91	9 42 47·7
15. Thur.	11 44 42·06	20 2	4 59 43·96	5 37 58·29	8 24 6·67	8 55 34·99	9 38 51·5

November 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Cygni	Altitude	Declination
		h. m. s.	° ′	° ′
3	ζ Cygni	0 30 26·45	68 16	29 45 N
3–2	α Cephei	— — —	79 23 N	62 6 N
3	β Aquarii	0 47 50·54	32 26	6 5 S
2–3	ε Pegasi	1 0 50·94	47 52	9 21 N
3	α Aquarii	1 22 7·54	37 38	0 53 S
3–4	ζ Pegasi	1 57 53·03	48 45	10 14 N
1–2	α Piscis Austr. (*Fomalhaut*) .	2 13 24·01	8 17	30 14 S
2	α Pegasi (*Markab*) . . .	2 21 7·83	53 6	14 35 N
3–4	γ Cephei	2 56 43·57	64 30 N	76 59 N
2	α Andromedæ	— — —	66 58	28 27 N
3–2	γ Pegasi	3 29 13·81	53 3	14 32 N
2–3	α Cassiopeiæ	— — —	85 35 N	55 54 N
2	β Ceti	3 59 38·76	19 53	18 38 S
2–3	β Andromedæ	4 25 3·84	73 31	35 0 N
3	θ Ceti	4 39 59·88	29 44	8 47 S
1	α Eridani (*Achernar*) . . .	4 55 7·82	(South)	57 50 S
3–2	β Arietis	5 9 55·73	58 45	20 14 N
2	α Arietis	5 22 18·00	61 26	22 55 N
2–3	α Ceti	6 17 43·53	42 8	3 37 N

	° ′		h. m. s.
Arcturus (by daylight)	58 18	Subtract	6 26 4·49
Vega ,,	77 12	,,	2 4 8·64

November 16 to 30.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	ε Pegasi 47° 52′	α Cassiopeiæ 85° 35′ (North)	θ Ceti 29° 44′	α Arietis 61° 26′	Polaris 52° 48′ (North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m s.
16. Fri.	11 44 52·61	19 47	5 56 49·04	8 51 39·06	9 35 48·10	10 18 6·28	9 34 55·3
17. Sat.	11 45 4·00	19 32	5 52 43·12	8 47 43·14	9 31 52·19	10 14 10·37	9 30 59·0
18. Sun.	11 45 16·25	19 18	5 48 47·20	8 43 47·21	9 27 56·27	10 10 14·46	9 27 2·7
19. Mon.	11 45 29·34	18 3	5 44 51·27	8 39 51·28	9 24 0·36	10 6 18·55	9 23 6·2
20. Tues.	11 45 43·27	18 50	5 40 55·35	8 35 55·35	9 20 4·44	10 2 22·64	9 19 9·7
21. Wed.	11 45 58·03	18 36	5 36 59·42	8 31 59·42	9 16 8·53	9 58 26·73	9 15 13·2
22. Thur.	11 46 13·61	18 23	5 33 3·50	8 28 3·49	9 12 12·61	9 54 30·81	9 11 16·7
23. Fri.	11 46 30·00	18 10	5 29 7·58	8 24 7·57	9 8 16·69	9 50 34·90	9 7 20·3
24. Sat.	11 46 47·19	17 58	5 25 11·65	8 20 11·64	9 4 20·78	9 46 38·99	9 3 23·8
25. Sun.	11 47 5·16	17 46	5 21 15·73	8 16 15·71	9 0 24·86	9 42 43·08	8 59 27·4
26. Mon.	11 47 23·91	17 34	5 17 19·80	8 12 19·78	8 56 28·95	9 38 47·17	8 55 31·0
27. Tues.	11 47 43·40	17 23	5 13 23·88	8 8 23·85	8 52 33·03	9 34 51·26	8 51 34·6
28. Wed.	11 48 3·63	17 12	5 9 27·96	8 4 27·92	8 48 37·11	9 30 55·34	8 47 38·3
29. Thur.	11 48 24·57	17 2	5 5 32·04	8 0 31·99	8 44 41·19	9 26 59·43	8 43 41·9
30. Fri.	11 48 46·20	16 52	5 1 36·11	7 56 36·05	8 40 45·28	9 23 3·51	8 39 45·5

November 16 to 30.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of ϵ Pegasi	Altitude	Declination
		h. m. s.	° ′	° ′
3	α Aquarii	0 21 16·64	37 38	0 53 S
3–4	ζ Pegasi	0 57 2·12	48 45	10 14 N
1–2	α Piscis Aust. (*Fomalhaut*) . .	1 12 33·05	8 17	30 14 S
2	α Pegasi (*Markab*) . . .	1 20 16·93	53 6	14 35 N
3–4	γ Cephei	1 55 51·48	64 30 N	76 59 N
2	α Andromedæ	2 23 31·73	66 58	28 27 N
3–2	γ Pegasi (*Algenib*) . . .	2 28 22·98	53 3	14 32 N
2–3	α Cassiopeiæ	— — —	85 35 N	55 54 N
2	β Ceti	2 58 47·96	19 53	18 38 S
2–3	β Andromedæ	3 24 13·07	73 31	35 0 N
3	θ Ceti	— — —	29 44	8 47 S
1	α Eridani (*Achernar*) . . .	3 54 16·84	(South)	57 50 S
3–2	β Arietis	4 9 5·09	58 45	20 14 N
2	α Arietis	— — —	61 26	22 55 N
3–4	γ^2 Ceti	4 58 0·52	41 15	2 44 N
2–3	α Ceti	5 16 53·00	42 8	3 37 N
2	α Persei	5 36 40·71	87 58	49 27 N
3	ϵ Eridani	5 48 2·85	28 40	9 51 S
3	η Tauri	6 1 8·49	62 15	23 44 N

	° ′		h. m. s.
Arcturus (by daylight)	58 18	Subtract	7 26 54·90
Vega ,,	77 12	,,	3 4 59·56

December 1 to 15.

Mean Time of Transit at Greenwich.

1883	The Sun	Sun's Alt.	ε Pegasi 47° 52′	α Pegasi (Markab) 53° 6′	α Arietis 61° 26′	α Ceti 42° 8′	Polaris 52°48′(North)
	h. m. s.	° ′	h. m. s.	h. m. s.	h. m. s.	h. m s.	h. m. s.
1. Sat.	11 49 8·49	16 42	4 57 40·19	6 17 57·13	9 19 7·60	10 14 33·25	8 35 49·0
2. Sun.	11 49 31·42	16 33	4 53 44·27	6 14 1·20	9 15 11·68	10 10 37·34	8 31 52·4
3. Mon.	11 49 54·97	16 25	4 49 48·35	6 10 5·28	9 11 15·77	10 6 41·43	8 27 55·9
4. Tues.	11 50 19·10	16 16	4 45 52·43	6 6 9·36	9 7 19·85	10 2 45·52	8 23 59·2
5. Wed.	11 50 43·78	16 8	4 41 56·50	6 2 13·44	9 3 23·94	9 58 49·61	8 20 2·5
6. Thur	11 51 9·00	16 1	4 38 0·58	5 58 17·51	8 59 28·02	9 54 53·70	8 16 5·8
7. Fri.	11 51 34·72	15 54	4 34 4·66	5 54 21·59	8 55 32·11	9 50 57·79	8 12 9·2
8. Sat.	11 52 0·91	15 47	4 30 8·74	5 50 25·66	8 51 36·19	9 47 1·87	8 8 12·5
9. Sun.	11 52 27·55	15 41	4 26 12·81	5 46 29·74	8 47 40·27	9 43 5·96	8 4 15·9
10. Mon.	11 52 54·61	15 36	4 22 16·89	5 42 33·81	8 43 44·35	9 39 10·04	8 0 19·3
11. Tues.	11 53 22·06	15 31	4 18 20·97	5 38 37·89	8 39 48·43	9 35 14·13	7 56 22·8
12. Wed.	11 53 49·89	15 26	4 14 25·04	5 34 41·96	8 35 52·51	9 31 18·21	7 52 26·3
13. Thur.	11 54 18·07	15 21	4 10 29·12	5 30 46·04	8 31 56·60	9 27 22·30	7 48 29·7
14. Fri.	11 54 46·56	15 18	4 6 33·20	5 26 50·11	8 28 0·68	9 23 26·38	7 44 33·2
15. Sat.	11 55 15·34	15 14	4 2 37·28	5 22 54·19	8 24 4·76	9 19 30·47	7 40 36·5

December 1 to 15.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of ϵ Pegasi	Altitude	Declination
		h. m. s.	°	° ′
3	α Aquarii	0 21 16·64	37 38	0 53 S
3–4	ζ Pegasi	0 57 2·11	48 45	10 14 N
1–2	α Piscis Aust. (*Fomalhaut*)	1 12 33·01	8 17	30 14 S
2	α Pegasi (*Markab*)	— — —	53 6	14 35 N
3–4	γ Cephei	1 55 50·78	64 30 N	76 59 N
2	α Andromedæ	2 23 31·72	66 58	28 27 N
3–2	γ Pegasi (*Algenib*)	2 28 22·99	53 3	14 32 N
2–3	α Cassiopeiæ	2 54 59·87	85 35 N	55 54 N
2	β Ceti	2 58 47·97	19 53	18 38 S
2–3	β Andromedæ	3 24 13·09	73 31	35 0 N
3	θ Ceti	3 39 9·19	29 44	8 47 S
1	α Eridani (*Achernar*)	3 54 16·71	(South)	57 50 S
3–2	β Arietis	4 9 5·16	58 45	20 14 N
2	α Arietis	— — —	61 26	22 55 N
3–4	γ^2Ceti	4 58 0·62	41 15	2 44 N
2–3	α Ceti	— — —	42 8	3 37 N
2	α Persei	5 36 40·85	87 58	49 27 N
3	ε Eridani	5 48 2·99	28 40	9 51 S
3	η Tauri	6 1 8·67	62 15	23 44 N
3	γ^1Eridani	6 13 7·99	24 40	13 51 S
1	α Tauri (*Aldebaran*)	6 49 41·17	54 47	16 16 N

	° ′		h. m. s.
Arcturus (by daylight)	58 18	Subtract	7 26 54·46
Vega ..	77 12	..	3 4 50·52

December 16 to 31.

Mean Time of Transit at Greenwich.

1883	The Sun			Sun's Alt.		α Pegasi (Markab) 53° 6′			α Andromedæ 66° 58′			α Persei 87° 58′			η Tauri 62° 15′			Polaris 52° 48 (North)		
	h.	m.	s.	°	′	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
16. Sun.	11	55	44·39	15	11	5	18	58·26	6	22	13·05	9	35	22·27	9	59	50·15	7	36	39·7
17. Mon.	11	56	13·66	15	9	5	15	2·34	6	18	17·12	9	31	26·36	9	55	54·24	7	32	42·9
18. Tues.	11	56	43·14	15	7	5	11	6·42	6	14	21·19	9	27	30·44	9	51	58·33	7	28	46·1
19. Wed.	11	57	12·79	15	6	5	7	10·49	6	10	25·27	9	23	34·52	9	48	2·41	7	24	49·3
20. Thur.	11	57	42·58	15	5	5	3	14·57	6	6	29·34	9	19	38·60	9	44	6·50	7	20	52·5
21. Fri.	11	58	12·48	15	4	4	59	18·65	6	2	33·42	9	15	42·68	9	40	10·58	7	16	55·7
22. Sat.	11	58	42·45	15	4	4	55	22·72	5	58	37·49	9	11	46·76	9	36	14·67	7	12	59·0
23. Sun.	11	59	12·46	15	4	4	51	26·80	5	54	41·56	9	7	50·85	9	32	18·76	7	9	2·3
24. Mon.	11	59	42·47	15	5	4	47	30·88	5	50	45·64	9	3	54·93	9	28	22·84	7	5	5·6
25. Tues.	12	0	12·45	15	6	4	43	34·96	5	46	49·71	8	59	59·01	9	24	26·93	7	1	8·9
26. Wed.	12	0	42·36	15	8	4	39	39·03	5	42	53·79	8	56	3·09	9	20	31·01	6	57	12·3
27. Thur.	12	1	12·16	15	11	4	35	43·11	5	38	57·86	8	52	7·17	9	16	35·10	6	53	15·6
28. Fri.	12	1	41·82	15	13	4	31	47·19	5	35	1·93	8	48	11·24	9	12	39·18	6	49	18·9
29. Sat.	12	2	11·30	15	17	4	27	51·27	5	31	6·01	8	44	15·32	9	8	43·27	6	45	22·1
30. Sun.	12	2	40·56	15	20	4	23	55·35	5	27	10·08	8	40	19·39	9	4	47·35	6	41	25·2
31. Mon.	12	3	9·56	15	24	4	19	59·43	5	23	14·16	8	36	23·47	9	0	51·43	6	37	28·4

December 16 to 31.

Transit of ADDITIONAL STARS. *Greenwich mean time.*

Mag.	Name of Star	Time to be added to the Transit of α Pegasi.			Altitude			Declination		
		h.	m.	s.	°	′		°	′	
3–4	γ Cephei	0	35	32·36	64	30	N	76	59	N
2	α Andromedæ	—	—	—	66	58		28	27	N
3–2	γ Pegasi (*Algenib*)	1	8	6·08	53	3		14	32	N
2–3	α Cassiopeiæ	1	34	42·67	85	35	N	55	54	N
2	β Ceti	1	38	31·04	19	53		18	38	S
2–3	β Andromedæ	2	3	56·15	73	31		35	0	N
3	θ Ceti	2	18	52·31	29	44		8	47	S
1	α Eridani (*Achernar*)	2	33	59·44	(South)			57	50	S
3–2	β Arietis	2	48	48·31	58	45		20	14	N
2	α Arietis	3	1	10·62	61	26		22	55	N
3–4	γ^2 Ceti	3	37	43·84	41	15		2	44	N
2–3	α Ceti	3	56	36·37	42	8		3	37	N
2	α Persei	—	—	—	87	58		49	27	N
3	ε Eridani	4	27	46·26	28	40		9	51	S
3	η Tauri	—	—	—	62	15		23	44	N
3	γ^1 Eridani	4	52	51·28	24	40		13	51	S
1	α Tauri (*Aldebaran*)	5	29	24·58	54	47		16	16	N
3	ι Aurigæ	5	49	32·10	71	30		32	59	N
1	α Aurigæ (*Capella*)	6	8	10·41	84	23		45	52	N
1	β Orionis (*Rigel*)	6	8	59·82	30	11		8	20	S
1	α Orionis	6	48	49·17	45	54		7	23	N

	°	′		h.	m.	s.
Arcturus (by daylight)	58	18	Subtract	8	47	10·79
Vega ,,	77	12	,,	4	25	16·27

January.

Day	Sun				Moon						Sidereal Time at Mean Noon.			Configuration of Jupiter's Satellites at 11 p.m.	Mean Temperature at 9 a.m.
	Rises		Sets		Rises		Transits		Sets						
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	s.	W E	°
1	8	8	4	0	—		5	m 39	11	m 11	18	43	11·0	3014●	39·0
2	8	8	4	1	1	m 1	6	22	11	34	18	47	7·6	34102	38·8
3	8	8	4	2	2	5	7	6	11	58	18	51	4·1	14320	38·7
4	8	8	4	3	3	11	7	52	0	a 28	18	55	0·7	4201●	38·6
5	8	8	4	4	4	15	8	42	1	5	18	58	57·3	41023	38·5
6	8	7	4	6	5	16	9	33	1	49	19	2	53·8	40213	38·5
7	8	7	4	7	6	13	10	28	2	43	19	6	50·4	42103	38·5
8	8	6	4	8	7	3	11	23	3	47	19	10	46·9	43201	38·6
9	8	6	4	9	7	46	0	a 19	4	59	19	14	43·5	34102	38·6
10	8	5	4	10	8	21	1	14	6	15	19	18	40·0	32041	38·7
11	8	5	4	12	8	52	2	8	7	34	19	22	36·6	204●●	38·8
12	8	4	4	14	9	20	3	1	8	54	19	26	33·2	10234	39·0
13	8	3	4	15	9	46	3	53	10	14	19	30	29·7	01234	39·1
14	8	2	4	17	10	10	4	44	11	32	19	34	26·3	21034	39·2
15	8	1	4	19	10	37	5	36	—		19	38	22·8	32014	39·3
16	8	0	4	20	11	7	6	30	0	m 49	19	42	19·4	31024	39·4
17	7	59	4	21	11	40	7	24	2	5	19	46	15·9	32014	39·5
18	7	58	4	23	0	a 21	8	19	3	17	19	50	12·5	23104	39·7
19	7	57	4	24	1	10	9	15	4	23	19	54	9·0	41023	39·8
20	7	56	4	26	2	7	10	9	5	21	19	58	5·6	40123	40·0
21	7	55	4	28	3	9	11	2	6	9	20	2	2·2	42103	40·2
22	7	54	4	30	4	14	11	53	6	50	20	5	58·7	42301	40·4
23	7	53	4	32	5	22	—		7	23	20	9	55·3	43102	40·5
24	7	52	4	33	6	30	0	m 41	7	51	20	13	51·8	24301	40·6
25	7	51	4	34	7	35	1	27	8	14	20	17	48·4	42310	40·7
26	7	50	4	36	8	40	2	10	8	36	20	21	44·9	14023	40·8
27	7	49	4	38	9	44	2	53	8	57	20	25	41·5	01423	40·9
28	7	48	4	40	10	48	3	35	9	17	20	29	38·1	21034	41·0
29	7	46	4	42	11	52	4	17	9	38	20	33	34·6	23014	41·1
30	7	45	4	44	—		5	0	10	1	20	37	31·2	31024	41·2
31	7	43	4	46	0	m 56	5	45	10	28	20	41	27·7	30214	41·3

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. ○ indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h.	m.	
Last Quarter	1	0	50	p.m.
New Moon	9	5	59	a.m.
First Quarter	16	0	48	a.m.
Full Moon	23	7	16	a.m.
Last Quarter	31	10	27	a.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches.
London	2·35
Manchester	3·24
Inverness	1·77
Dublin	2·76

January.

MERCURY.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	8 56	0 44	14 25	4 32
6	9 1	0 59	15 56	4 57
11	9 1	1 13	18 4	5 25
16	8 54	1 23	20 43	5 52
21	8 42	1 27	23 32	6 12
26	8 20	1 18	25 52	6 16

Mercury passes from Sagittarius into Capricornus, is favourably situated for observation during the latter part of the month after sunset in the S.W.

Near the Moon on the 10th.

Its declination is 24° S. on the 1st, 20° S. on the 11th, and 15° S. on the 21st

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	5 9	9 43	21 27	2 17
6	4 57	9 29	21 30	2 4
11	4 46	9 19	21 18	1 52
16	4 41	9 11	20 56	1 42
21	4 38	9 6	20 29	1 34
26	4 38	9 2	20 0	1 27

Venus is situated between Scorpio and Sagittarius. May be seen before sunrise in the S.E.

Near the Moon on the 6th, and attains its greatest brilliancy on the 11th.

Its declination is about 18° S. during the month.

MARS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	7 51	11 38	14 25	3 27
6	7 47	11 36	14 34	3 25
11	7 42	11 33	14 51	3 24
16	7 36	11 30	15 13	3 24
21	7 29	11 26	15 43	3 23
26	7 22	11 23	16 18	3 23

Mars, in Sagittarius, is unfavourably situated for observation during the month.

Near the Moon on the 8th.

Its declination s 24° S. on the 1st, and 22° S. on the 24th.

JUPITER.

Day	Rises p.m.	Transits p.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	2 38	10 51	61 32	7 8
6	2 15	10 29	61 31	6 45
11	1 53	10 6	61 30	6 23
16	1 31	9 45	61 30	6 1
21	1 10	9 23	61 29	5 40
26	0 50	9 2	61 29	5 20

Jupiter, situated between Taurus and Gemini, is a conspicuous object during the month.

Near the Moon on the 20th.

Its declination is about 23° North.

SATURN.

Day	Rises p.m.	Transits p.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	1 3	8 27	53 58	3 55
6	0 42	8 6	53 57	3 34
11	0 22	7 46	53 57	3 14
16	0 2	7 26	53 57	2 54
	a.m.			
21	11 43	7 7	53 58	2 35
26	11 24	6 47	54 0	2 17

Saturn, situated between Aries and Taurus, may be seen during the evening.

Near the Moon on the 17th.

Its declination is about 15 North

February.

Day	Sun		Moon			Sidereal Time at Mean Noon.	Configuration of Jupiter's Satellites at 10.30 p.m.	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.	W E	°
1	7 41	4 48	1 m 57	6 m 32	11 m 1	20 45 24·3	23104	41·5
2	7 40	4 49	2 59	7 21	11 40	20 49 20·8	01343	41·6
3	7 38	4 50	3 57	8 13	0 a 29	20 53 17·4	02438	41·6
4	7 36	4 52	4 49	9 7	1 27	20 57 13·9	21403	41·5
5	7 34	4 54	5 36	10 3	2 34	21 1 10·5	42031	41·4
6	7 32	4 56	6 16	10 59	3 50	21 5 7 0	43102	41·2
7	7 30	4 57	6 51	11 54	5 9	21 9 3·6	43021	41·0
8	7 29	4 59	7 20	0 a 49	6 30	21 13 0·2	42310	40·7
9	7 27	5 0	7 48	1 43	7 52	21 16 56·7	40138	40·4
10	7 25	5 2	8 14	2 37	9 14	21 20 53·3	41023	40·1
11	7 24	5 4	8 41	3 31	10 35	21 24 49·8	14203	39·8
12	7 22	5 6	9 12	4 25	11 52	21 28 46·4	24031	39·6
13	7 20	5 8	9 45	5 20	—	21 32 42·9	31024	39·4
14	7 18	5 10	10 23	6 15	1 m 6	21 36 39·5	30214	39·3
15	7 16	5 12	11 8	7 11	2 14	21 40 36·0	32104	39·2
16	7 14	5 14	0 a 1	8 5	3 16	21 44 32·6	20148	39·3
17	7 12	5 16	1 0	8 58	4 7	21 48 29·1	10234	39·4
18	7 10	5 18	2 3	9 48	4 50	21 52 25·7	12034	39·5
19	7 8	5 19	3 9	10 37	5 24	21 56 22·2	20348	39·6
20	7 7	5 21	4 15	11 22	5 54	22 0 18·8	31024	39·7
21	7 5	5 23	5 21	—	6 19	22 4 15·4	34012	39·8
22	7 3	5 25	6 26	0 m 7	6 41	22 8 11·9	43210	39·9
23	7 1	5 27	7 31	0 49	7 1	22 12 8·5	42018	40·0
24	6 59	5 29	8 35	1 32	7 22	22 16 5·0	41023	40·0
25	6 56	5 30	9 38	2 14	7 44	22 20 1·6	24013	40·1
26	6 54	5 32	10 42	2 56	8 6	22 23 58·1	42038	40·2
27	6 52	5 34	11 54	3 40	8 31	22 27 54·7	43102	40·2
28	6 50	5 36	—	4 26	9 1	22 31 51·2	34012	40·3

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. ○ indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h. m.
New Moon	7	6 10 p.m.
First Quarter	14	9 55 a.m.
Full Moon	22	0 18 a.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches
London	1·64
Manchester	2·19
Inverness	1·05
Dublin	2·45

February.

MERCURY.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	7 42	0 46	26 54	5 50
6	7 7	0 5	26 1	5 3
		a.m.		
11	6 34	11 24	24 20	4 14
16	6 14	10 55	22 48	3 36
21	6 1	10 37	21 52	3 13
26	5 55	10 30	21 35	3 5

Mercury, in Capricornus and Aquarius, is not favourably situated during this month.

Near the Moon on Feb. 7.

Its declination on the 1st is 12° S., 11th 14° S., and on the 21st 17° S.

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	4 38	9 0	19 27	1 22
6	4 41	8 59	19 5	1 19
11	4 43	9 0	18 50	1 17
16	4 45	9 1	18 45	1 17
21	4 46	9 3	18 50	1 20
26	4 46	9 6	19 8	1 24

Venus, situated in Sagittarius, may be seen in the S.E. before sunrise.

Near the Moon on the 4th.

Its declination is about 20° South.

MARS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	7 14	11 19	17 10	3 24
6	7 4	11 16	17 58	3 27
11	6 54	11 12	18 53	3 30
16	7 45	11 8	19 54	3 32
21	6 35	11 5	20 58	3 35
26	6 24	11 1	22 7	3 38

Mars, situated in Capricornus, cannot be seen during this month.

Near the Moon on the 6th.

Its declination varies from 21° S. to 16° S.

JUPITER.

Day	Rises p.m.	Transits p.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	0 24	8 37	61 29	4 54
6	0 3	8 17	61 29	4 33
	a.m.			
11	11 43	7 56	61 29	4 13
16	11 23	7 37	61 30	3 53
21	11 4	7 17	61 31	3 34
26	10 45	6 58	61 32	3 16

Jupiter, situated between Taurus and Gemini, may be seen during the evenings and early morning.

Near the Moon on the 16th.

Its declination is about 23° North.

SATURN.

Day	Rises a.m.	Transits p.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	10 59	6 24	54 4	1 53
6	10 39	6 5	54 7	1 34
11	10 20	5 46	54 12	1 16
16	10 0	5 27	54 16	0 57
21	9 41	5 8	54 22	0 39
26	9 22	4 50	54 28	0 20

Saturn, situated between Aries and Taurus, is visible during the evenings.

Near the Moon on the 14th.

Its declination is about 16° North.

March.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites at 10 p.m.	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s	W E	°
1	6 48	5 37	0 m45	5 m13	9 m37	22 35 47·8	32104	40·3
2	6 46	5 39	1 44	6 3	10 20	22 39 44·3	23014	40·4
3	6 44	5 41	2 38	6 55	11 13	22 43 40·9	10234	40·4
4	6 42	5 43	3 26	7 48	0 a 13	22 47 37·4	02134	40·4
5	6 40	5 45	4 7	8 42	1 22	22 51 34·0	21034	40·3
6	6 38	5 46	4 44	9 37	2 38	22 55 30·5	1304●	40·3
7	6 36	5 48	5 16	10 32	3 59	22 59 27·1	30124	40·3
8	6 34	5 50	5 45	11 27	5 21	23 3 23·6	32104	40·3
9	6 31	5 51	6 11	0 a 22	6 45	23 7 20·2	23041	40·3
10	6 28	5 53	6 40	1 17	8 8	23 11 16·7	41023	40·3
11	6 26	5 55	7 10	2 13	9 30	23 15 13·3	40213	40·3
12	6 23	5 57	7 43	3 10	10 49	23 19 9·8	42103	40·3
13	6 21	5 58	8 22	4 8	—	23 23 6·4	4301●	40·3
14	6 18	6 0	9 6	5 5	0 m 2	23 27 3·0	4302●	40·4
15	6 16	6 2	9 58	6 1	1 8	23 30 59·5	43210	40·4
16	6 13	6 4	10 55	6 54	2 4	23 34 56·1	42301	40·5
17	6 11	6 6	11 58	7 46	2 48	23 38 52·6	41023	40·5
18	6 9	6 8	1 a 2	8 34	3 26	23 42 49·2	04213	40·6
19	6 7	6 10	2 8	9 21	3 56	23 46 45·7	21034	40·6
20	6 5	6 11	3 14	10 5	4 23	23 50 42·3	20314	40·6
21	6 3	6 12	4 18	10 48	4 45	23 54 38·8	3024●	40·6
22	6 1	6 14	5 22	11 30	5 7	23 58 35·4	32104	40·7
23	5 59	6 15	6 25	—	5 29	0 2 31·9	23014	40·8
24	5 57	6 17	7 29	0 m12	5 49	0 6 28·5	10324	40·9
25	5 54	6 18	8 32	0 55	6 11	0 10 25·0	01243	41·1
26	5 52	6 20	9 35	1 38	6 36	0 14 21·6	21043	41·4
27	5 50	6 22	10 36	2 23	7 5	0 18 18·1	42031	41·7
28	5 48	6 24	11 36	3 10	7 39	0 22 14·7	43102	42·1
29	5 45	6 26	—	3 58	8 18	0 26 11·2	12430	42·5
30	5 43	6 28	0 m31	4 48	9 5	0 30 7 8	43201	42·9
31	5 41	6 30	1 19	5 39	10 2	0 34 4·3	4102●	43·4

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. O indicates Jupiter— that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h.	m.	
Last Quarter	2	5	26	a.m.
New Moon	9	4	31	a.m.
First Quarter	15	8	31	p.m.
Full Moon	23	6	5	p.m.
Last Quarter	31	8	21	p.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inch
London	1·61
Manchester	2·45
Inverness	1·75
Dublin	1·72

March.

MERCURY.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	5 53	10 28	21 44	3 3
6	5 51	10 30	22 28	3 9
11	5 47	10 34	23 47	3 21
16	5 44	10 41	25 40	3 38
21	5 39	10 50	28 6	4 1
26	5 34	11 0	31 2	4 26

Mercury, in Capricornus, Aquarius, and Pisces, is not favourably situated during this month for observation.

Near the Moon on the 7th.

Its declination is 17° S. on the 1st, 15° S. on the 11th, and 10° S. on the 21st.

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	4 47	9 8	19 24	1 29
6	4 46	9 11	20 1	1 36
11	4 44	9 14	20 51	1 44
16	4 41	9 17	21 53	1 54
21	4 37	9 21	23 7	2 5
26	4 32	9 24	24 33	2 17

Venus, situated in Capricornus, may be seen towards the S.E. before sunrise.

Near the Moon on the 5th.

Its declination is 19° S. on the 1st, 18° S. on the 11th, and 15° S. on the 21st.

MARS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	6 16	10 58	22 51	3 40
6	6 4	10 54	24 8	3 42
11	5 51	10 49	25 27	3 45
16	5 40	10 44	26 50	3 48
21	5 29	10 40	28 16	3 51
26	5 17	10 35	29 43	3 54

Mars, situated in Capricornus and Aquarius, cannot be seen, as it rises only a short time before the Sun.

Near the Moon on the 7th.

Its declination varies from 16° S. to 7° S. during the month.

JUPITER.

Day	Rises a.m.	Transits p.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	10 34	6 47	61 33	3 4
6	10 15	6 29	61 35	2 45
11	9 57	6 10	61 37	2 27
16	9 39	5 53	61 39	2 10
21	9 21	5 35	61 41	1 53
26	9 4	5 18	61 44	1 37

Jupiter, situated between Taurus and Gemini, may be seen in the evening and early morning.

Near the Moon on the 15th.

Its declination is about 23° North.

SATURN.

Day	Rises a.m.	Transits p.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	9 11	4 39	54 32	0 11 p.m.
6	8 52	4 21	54 39	11 52
11	8 33	4 3	54 46	11 33
16	8 14	3 45	54 54	11 15
21	7 56	3 27	55 2	10 58
26	7 37	3 9	55 11	10 41

Saturn, situated in Taurus, is only visible during the evening.

Near the Moon on the 13th.

Its declination is about 16° North.

April.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites at 9.30 p.m.	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.	W E	°
1	5 38	6 31	2 m 2	6 m 31	11 m 5	0 38 0·9	40123	43·8
2	5 36	6 33	2 39	7 24	0 a 16	0 41 57·4	42103	44·2
3	5 34	6 35	3 12	8 17	1 31	0 45 54·0	24031	44·6
4	5 32	6 37	3 41	9 10	2 50	0 49 50·5	31042	44·9
5	5 29	6 38	4 10	10 4	4 12	0 53 47·1	30124	45·0
6	5 27	6 40	4 37	10 59	5 34	0 57 43·7	3204●	45·1
7	5 24	6 41	5 6	11 55	6 58	1 1 40·2	104●●	45·2
8	5 22	6 43	5 38	0 a 53	8 21	1 5 36·8	01234	45·2
9	5 20	6 44	6 15	1 52	9 40	1 9 33·3	12034	45·2
10	5 18	6 45	6 57	2 51	10 51	1 13 29·9	20134	45·2
11	5 15	6 46	7 48	3 50	11 54	1 17 26·4	13024	45·3
12	5 13	6 48	8 46	4 47	—	1 21 23·0	34012	45·4
13	5 11	6 50	9 48	5 40	0 m 45	1 25 19·5	34210	45·5
14	5 9	6 52	10 53	6 31	1 25	1 29 16·1	4310●	45·6
15	5 7	6 53	11 59	7 18	1 59	1 33 12·6	40123	45·7
16	5 5	6 55	1 a 5	8 3	2 26	1 37 9·2	41203	45·8
17	5 2	6 57	2 10	8 47	2 50	1 41 5·7	42013	45·9
18	5 0	6 59	3 14	9 29	3 14	1 45 2·3	41302	46·0
19	4 58	7 0	4 18	10 11	3 34	1 48 58·8	34012	46·1
20	4 56	7 2	5 20	10 53	3 55	1 52 55·4	32140	46·1
21	4 55	7 4	6 24	11 36	4 17	1 56 51·9	13204	46·2
22	4 53	7 6	7 28	—	4 40	2 0 48·5	0324●	46·2
23	4 51	7 8	8 29	0 m 21	5 8	2 4 45·1	12034	46·2
24	4 49	7 10	9 29	1 7	5 40	2 8 41·6	20134	46·2
25	4 47	7 11	10 25	1 55	6 18	2 12 38·2	31024	46·2
26	4 45	7 13	11 15	2 45	7 3	2 16 34·7	30124	46·2
27	4 43	7 14	—	3 35	7 56	2 20 31·3	32104	46·3
28	4 41	7 16	0 m 1	4 26	8 56	2 24 27·8	32014	46·3
29	4 39	7 17	0 39	5 18	10 3	2 28 24·4	4032●	46·3
30	4 37	7 19	1 12	6 9	11 14	2 32 20·9	24103	46·3

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. O indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc

Phases of the Moon.

	d.	h.	m.	
New Moon	7	1	36	p.m.
First Quarter	14	8	50	a.m.
Full Moon	22	11	27	a.m.
Last Quarter	30	7	3	a.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches.
London	2·02
Manchester	2·03
Inverness	1·35
Dublin	1·96

April.

MERCURY.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	5 27	11 14	35 13	5 1
6	5 19	11 27	39 11	5 35
11	5 14	11 43	43 31	6 12
		p.m.		
16	5 8	0 1	48 4	6 54
21	5 4	0 21	52 35	7 38
26	5 0	0 41	56 38	8 22

Mercury, situated in Pisces and Aries, may be observed the latter part of the month after sunset towards the N.W.

Near the Moon on the 6th.

Its declination is 3° S. on the 1st, 5° N. on the 11th, and 14° N. on the 21st.

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m
1	4 24	9 27	26 29	2 30
6	4 18	9 30	28 15	2 42
11	4 12	9 33	30 10	2 54
16	4 4	9 35	32 11	3 6
21	3 55	9 37	34 17	3 19
26	3 46	9 40	36 28	3 32

Venus, situated in Aquarius and Pisces, is visible towards the S.E. for a short time before sunrise

Ne the Moon on the 4th.

Its declination is 12° S. on the 1st, 8° S. on the 11th, and 4° S. on the 21st.

MARS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	5 0	10 28	31 31	3 56
6	4 48	10 23	33 3	3 59
11	4 35	10 18	34 35	4 1
16	4 21	10 12	36 8	4 4
21	4 7	10 7	37 41	4 7
26	3 54	10 1	39 13	4 9

Mars, situated in Pisces, may be seen in the east a short time before sunrise.

Near the Moon on the 5th.

Its declination on the 1st is 7° S., 11th 4° S., and on the 21st 1° S.

JUPITER.

Day	Rises a.m.	Transits p.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	8 43	4 57	61 46	1 14
6	8 26	4 41	61 49	0 58
11	8 9	4 24	61 51	0 42
16	7 52	4 8	61 53	0 26
21	7 36	3 52	61 54	0 11
				p.m.
26	7 20	3 36	61 56	11 56

Jupiter, situated in Taurus, is visible during the evening.

Near the Moon on the 12th.

Its declination is about 23° North.

SATURN.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	7 15	2 48	55 21	10 21
6	6 56	2 31	55 30	10 4
11	6 38	2 13	55 39	9 48
16	6 20	1 56	55 48	9 31
21	6 3	1 39	55 57	9 15
26	5 45	1 21	56 7	8 59

Saturn, situated in Taurus, may be seen for a short time after sunset.

Near the Moon on the 10th.

Its declination is about 17° North.

May.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites at 9 p.m.	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.	W E	°
1	4 35	7 21	1 m 42	7 m 0	0 a 28	2 36 17·5	42013	46·4
2	4 33	7 23	2 9	7 52	1 46	2 40 14·0	41032	46·5
3	4 31	7 24	2 36	8 44	3 6	2 44 10·6	43012	46·7
4	4 29	7 26	3 3	9 38	4 28	2 48 7·1	43210	47·0
5	4 28	7 27	3 33	10 34	5 49	2 52 3·7	43201	47·3
6	4 26	7 29	4 6	11 32	7 10	2 56 0·3	41032	47·6
7	4 24	7 30	4 45	0 a 32	8 27	2 59 56·8	14023	47·9
8	4 22	7 31	5 33	1 32	9 35	3 3 53·4	20143	48·2
9	4 21	7 33	6 28	2 32	10 34	3 7 49·9	1034●	48·4
10	4 19	7 34	7 31	3 29	11 21	3 11 46·5	30124	48·7
11	4 17	7 36	8 38	4 22	11 57	3 15 43·0	31204	49·0
12	4 15	7 38	9 46	5 12	—	3 19 39·6	32014	49·4
13	4 14	7 39	10 53	5 59	0 m 27	3 23 36·1	10324	49·7
14	4 12	7 41	11 59	6 44	0 54	3 27 32·7	01234	50·1
15	4 11	7 42	1 a 4	7 27	1 18	3 31 29·3	2043●	50·5
16	4 10	7 44	2 8	8 9	1 39	3 35 25·8	41203	50·9
17	4 8	7 45	3 11	8 51	1 59	3 39 22·4	43012	51·3
18	4 6	7 47	4 15	9 34	2 21	3 43 18·9	43120	51·7
19	4 5	7 48	5 19	10 18	2 44	3 47 15·5	43201	52·0
20	4 4	7 49	6 22	11 4	3 11	3 51 12·0	41302	52·3
21	4 3	7 50	7 22	11 51	3 41	3 55 8·6	40123	52·6
22	4 2	7 51	8 20	—	4 16	3 59 5·1	42103	52·9
23	4 0	7 53	9 14	0 m 41	5 0	4 3 1·7	42103	53·1
24	3 59	7 55	10 0	1 32	5 51	4 6 58·3	34012	53·3
25	3 58	7 57	10 41	2 23	6 50	4 10 54·8	23104	53·5
26	3 57	7 58	11 16	3 15	7 56	4 14 51·4	32014	53·7
27	3 56	7 59	11 46	4 6	9 4	4 18 47·9	13024	53·9
28	3 55	8 0	—	4 56	10 16	4 22 44·5	01234	54·1
29	3 54	8 1	0 m 13	5 47	11 31	4 26 41·0	21034	54·4
30	3 53	8 2	0 39	6 37	0 a 47	4 30 37·6	12034	54·6
31	3 52	8 3	1 4	7 28	2 4	4 34 34·1	30124	54·9

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. ○ indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h.	m.	
New Moon	6	9	58	p.m.
First Quarter	13	10	54	p.m.
Full Moon	22	3	12	a.m.
Last Quarter	29	2	23	p.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches.
London	1·92
Manchester	2·23
Inverness	1·78
Dublin	1·58

May.

MERCURY.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	4 58	1 0	59 51	9 2
6	4 58	1 15	62 2	9 32
11	4 58	1 24	63 13	9 50
16	4 59	1 27	63 32	9 55
21	4 56	1 21	63 8	9 46
26	4 48	1 7	62 10	9 26

Mercury, in Taurus, is favourably situated for observation during the evening in the N.W. after sunset.

Near the Moon on the 8th.

Its declination on the 1st is 21° N., 11th, 25° N., and on the 22nd 24° N.

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	3 37	9 42	38 41	3 47
6	3 28	9 44	40 56	4 0
11	3 18	9 46	43 10	4 14
16	3 9	9 49	45 23	4 28
21	3 2	9 52	47 34	4 42
26	2 54	9 55	49 40	4 56

Venus, situated in Pisces and Aries, may be seen for a short time before sunrise in the east.

Near the Moon on the 4th.

Its declination is 0° on the 1st, 5° N. on the 11th, and 9° N. on the 21st.

MARS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	3 41	9 56	40 47	4 11
6	3 27	9 50	42 18	4 14
11	3 14	9 45	43 48	4 16
16	3 1	9 39	45 17	4 17
21	2 48	9 33	46 42	4 18
26	2 35	9 28	48 6	4 20

Mars, situated in Pisces, is visible for a short time before sunrise in the east.

Near the Moon on the 4th, and Venus on the 10th.

Its declination varies from 11° N. to 18° N.

JUPITER.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	7 4	3 20	61 57	11 36
6	6 48	3 5	61 57	11 20
11	6 33	2 49	61 57	11 5
16	6 18	2 34	61 57	10 50
21	6 3	2 19	61 56	10 35
26	5 48	2 4	61 55	10 20

Jupiter, situated in the western part of Gemini, may be seen in the evening only.

Near the Moon on the 11th.

Its declination is about 23° North.

SATURN.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	5 26	1 4	56 16	8 42
6	5 8	0 47	56 25	8 26
11	4 50	0 30	56 34	8 10
16	4 32	0 13 a.m.	56 42	7 54
21	4 14	11 56	56 51	7 38
26	3 56	11 39	56 59	7 22

Saturn, in Taurus, is unfavourably situated during the month.

Near the Moon on the 7th.

Its declination is about 18° North.

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that it provides the mean
so that the observer in an
left in any uncertainty a
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to all who have used it.

In order to make th

June.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.		°
1	3 51	8 4	1m 32	8m 22	3 a 25	4 38 30·7		55·1
2	3 51	8 5	2 3	9 17	4 45	4 42 27·3		55·3
3	3 50	8 6	2 38	10 15	6 3	4 46 23·8		55·5
4	3 50	8 7	3 20	11 14	7 14	4 50 20·4		55·7
5	3 49	8 8	4 12	0 a 14	8 18	4 54 16·9		55·8
6	3 48	8 9	5 11	1 13	9 10	4 58 13·5		55·9
7	3 47	8 10	6 17	2 9	9 53	5 2 10·0		56·0
8	3 47	8 11	7 25	3 2	10 29	5 6 6·6		56·1
9	3 46	8 11	8 36	3 52	10 57	5 10 3·2		56·1
10	3 46	8 12	9 43	4 38	11 22	5 13 59·7		56·2
11	3 45	8 13	10 49	5 22	11 44	5 17 56·3		56·3
12	3 45	8 14	11 55	6 5	—	5 21 52·8		56·4
13	3 45	8 15	1 a 0	6 47	0m 5	5 25 49·4		56·5
14	3 45	8 15	2 4	7 30	0 26	5 29 45·9		56·7
15	3 44	8 16	3 6	8 13	0 48	5 33 42·5		56·9
16	3 44	8 16	4 10	8 59	1 12	5 37 39·1		57·1
17	3 44	8 16	5 12	9 46	1 42	5 41 35·6		57·3
18	3 44	8 17	6 11	10 35	2 16	5 45 32·2		57·5
19	3 44	8 17	7 7	11 26	2 56	5 49 28·7		57·8
20	3 44	8 18	7 58	—	3 45	5 53 25·3		58·1
21	3 45	8 18	8 42	0m 18	4 41	5 57 21·8		58·4
22	3 45	8 18	9 19	1 10	5 44	6 1 18·4		58·7
23	3 45	8 19	9 51	2 2	6 53	6 5 15·0		59·0
24	3 45	8 19	10 18	2 54	8 6	6 9 11·5		59·3
25	3 46	8 19	10 45	3 44	9 20	6 13 8·1		59·5
26	3 46	8 18	11 10	4 35	10 37	6 17 4·6		59·6
27	3 46	8 18	11 36	5 25	11 53	6 21 1·2		59·6
28	3 46	8 18	—	6 16	1 a 9	6 24 57·7		59·5
29	3 47	8 18	0m 4	7 9	2 25	6 28 54·3		59·4
30	3 47	8 18	0 36	8 4	3 43	6 32 50·9		59·3

The Satellites of Jupiter are invisible during June, Jupiter being too near the Sun.

Phases of the Moon.

	d.	h.	m.	
New Moon	5	6	13	a.m.
First Quarter	12	2	42	p.m.
Full Moon	20	4	32	p.m.
Last Quarter	27	7	38	p.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches.
London	2·67
Manchester	3·16
Inverness	2·25
Dublin	2·02

June.

MERCURY.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	4 33	0 39	60 28	8 45
6	4 14	0 10	58 52	8 6
		a.m.		
11	3 53	11 40	57 29	7 27
16	3 31	11 12	56 38	6 53
21	3 11	10 51	56 30	6 31
26	2 53	10 37	57 6	6 21

Mercury, in Taurus, is not favourably situated during the month.

Near the Moon on the 5th.

Its declination is 22° N. on the 1st, 19° N. on the 11th, and 18° N. on the 21st.

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	2 45	9 59	52 4	5 13
6	2 38	10 3	53 56	5 27
11	2 32	10 7	55 39	5 42
16	2 28	10 12	57 12	5 56
21	2 24	10 17	58 33	6 10
26	2 23	10 23	59 41	6 25

Venus, situated in Taurus, may be seen for a short time before sunrise in the N.E.

Near the Moon on the 3rd.

Its declination is 14° N. on the 1st, 17° N. on the 11th, and 20° N. on the 21st.

MARS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	2 20	9 21	49 42	4 22
6	2 7	9 16	51 1	4 24
11	1 54	9 10	52 16	4 26
16	1 42	9 5	53 27	4 27
21	1 31	8 59	54 34	4 28
26	1 20	8 54	55 37	4 29

Mars, situated in Aries and Taurus, is visible for a short time before sunrise in the N.E.

Near the Moon on the 2nd.

Its declination is 11° N. on the 1st, and 16° N. on the 21st.

JUPITER.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	5 31	1 46	61 53	10 1
6	5 16	1 31	61 50	9 45
11	5 2	1 16	61 47	9 30
16	4 47	1 1	61 43	9 15
21	4 32	0 46	61 39	9 0
26	4 17	0 31	61 34	8 45

Jupiter, in Gemini, is unfavourably situated for observation during this month.

Near the Moon on the 6th.

Its declination is about 23° North.

SATURN.

Day	Rises a.m	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	3 35	11 19	57 9	7 3
6	3 17	11 2	57 17	6 47
11	3 0	10 45	57 24	6 30
16	2 42	10 28	57 31	6 14
21	2 23	10 10	57 38	5 57
26	2 5	9 53	57 45	5 40

Saturn, situated in Taurus, is visible for a short time before sunrise in the N.E.

Near the Moon on the 4th.

Its declination is about 19° North.

July.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.		°
1	3 48	8 18	1 m 14	9 m 1	4 a 56	6 36 47·4		59·2
2	3 49	8 17	2 0	10 0	6 3	6 40 44·0		59·1
3	3 50	8 17	2 54	10 58	6 59	6 44 40·5		59·0
4	3 51	8 16	3 57	11 55	7 47	6 48 37·1		59·0
5	3 52	8 16	5 4	0 a 50	8 26	6 52 33·6		59·1
6	3 53	8 15	6 15	1 42	8 58	6 56 30·2		59·3
7	3 54	8 15	7 25	2 30	9 23	7 0 26·8		59·5
8	3 55	8 14	8 35	3 16	9 47	7 4 23·3		59·8
9	3 56	8 14	9 40	4 0	10 10	7 8 19·9		60·1
10	3 57	8 13	10 45	4 43	10 30	7 12 16·4		60·3
11	3 58	8 13	11 48	5 25	10 53	7 16 13·0		60·5
12	3 59	8 12	0 a 52	6 8	11 16	7 20 9·5		60·7
13	4 0	8 11	1 56	6 53	11 44	7 24 6·1		60·9
14	4 1	8 10	2 59	7 39	—	7 28 2·7		61·0
15	4 2	8 9	4 0	8 27	0 m 15	7 31 59·2		61·0
16	4 3	8 8	4 57	9 17	0 52	7 35 55·8		61·1
17	4 4	8 7	5 49	10 8	1 36	7 39 52·3		61·1
18	4 5	8 6	6 36	11 1	2 28	7 43 48·9		61·1
19	4 6	8 5	7 16	11 54	3 30	7 47 45·4		61·0
20	4 7	8 4	7 51	—	4 38	7 51 42·0		60·9
21	4 9	8 3	8 22	0 m 47	5 51	7 55 38·5		60·8
22	4 10	8 2	8 49	1 40	7 7	7 59 35·1		60·7
23	4 11	8 0	9 15	2 31	8 24	8 3 31·7		60·6
24	4 12	7 58	9 41	3 22	9 41	8 7 28·2		60·6
25	4 14	7 56	10 9	4 14	10 59	8 11 24·8		60·6
26	4 15	7 54	10 41	5 6	0 a 15	8 15 21·3		60·6
27	4 17	7 53	11 17	6 0	1 31	8 19 17·9		60·6
28	4 19	7 51	11 58	6 56	2 45	8 23 14·4		60·6
29	4 21	7 50	—	7 52	3 51	8 27 11·0		60·6
30	4 23	7 49	0 m 48	8 49	4 50	8 31 7·5		60·6
31	4 24	7 47	1 46	9 46	5 42	8 35 4·1		60·6

The Satellites of Jupiter are invisible during July, Jupiter being too near the Sun.

Phases of the Moon.

	d.	h.	m.	
New Moon	4	3	4	p.m.
First Quarter	12	7	49	a.m.
Full Moon	20	3	31	a.m.
Last Quarter	27	0	13	a.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches
London	2·47
Manchester	3·81
Inverness	2·78
Dublin	2·41

July

MERCURY.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	2 41	10 32	58 11	6 23
6	2 34	10 34	59 32	6 34
11	2 37	10 45	60 48	6 53
16	2 48	11 2	61 35	7 16
21	3 13	11 26	61 29	7 39
26	3 46	11 51	60 17	7 56

Mercury, situated in Gemini and Cancer, may be seen for a short time before sunrise during the early part of the month in the N.E.

Near the Moon on the 3rd.

Its declination is 20° N. on the 1st, 22° N. on the 11th, and 23° N. on the 23rd.

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	2 23	10 29	60 35	6 35
6	2 25	10 35	61 14	6 46
11	2 29	10 42	61 36	6 55
16	2 35	10 48	61 42	7 2
21	2 42	10 55	61 31	7 8
26	2 52	11 2	61 3	7 12

Venus, situated in Taurus and Gemini, may be seen for a short time before sunrise in the N.E.

Near the Moon on the 2nd.

Its declination is about 23° N. throughout the month.

MARS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	1 9	8 49	56 36	4 29
6	0 58	8 44	57 30	4 30
11	0 47	8 39	58 20	4 30
16	0 37	8 33	59 5	4 29
21	0 27	8 28	59 45	4 29
26	0 17	8 23	60 20	4 28

Mars, situated in Taurus, may be seen in the morning towards the end of the month.

Near the Moon on the 1st and 29th.

Its declination varies from 18° N. to 22° N.

JUPITER.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	4 4	0 17	61 29	8 30
6	3 49	0 2	61 23	8 15
		a.m.		
11	3 35	11 47	61 16	7 59
16	3 21	11 32	61 9	7 43
21	3 7	11 17	61 1	7 27
26	2 53	11 2	60 53	7 11

Jupiter, situated in Gemini, is visible at the latter part of the month for a short time before sunrise in the N.E.

Near the Moon on the 4th.

Its declination is about 23° North.

SATURN.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	1 48	9 36	57 50	5 24
6	1 30	9 19	57 56	5 7
11	1 12	9 1	58 1	4 50
16	0 54	8 44	58 6	4 33
21	0 36	8 26	58 11	4 16
26	0 18	8 8	58 15	3 59

Saturn, situated in Taurus, is visible in the early morning.

Near the Moon on the 1st and 29th.

Its declination is about 20° North.

August.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites at 3 a.m.	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.	W E	°
1	4 26	7 46	2m 49	10m 40	6a 23	8 39 0·7		60·7
2	4 27	7 44	3 58	11 32	6 56	8 42 57·2	20134	60·7
3	4 28	7 43	5 7	0a 22	7 26	8 46 53·8	12034	60·8
4	4 30	7 42	6 16	1 9	7 50	8 50 50·3	03124	60·8
5	4 32	7 40	7 22	1 54	8 14	8 54 46·9	31204	60·8
6	4 33	7 38	8 29	2 38	8 35	8 58 43·4	32014	60·8
7	4 35	7 36	9 35	3 21	8 58	9 2 40·0	3024●	60·9
8	4 36	7 34	10 39	4 4	9 20	9 6 36·5	10342	60·9
9	4 37	7 32	11 41	4 47	9 46	9 10 33·1	24013	60·9
10	4 39	7 31	0a 43	5 32	10 15	9 14 29·7	41203	60·9
11	4 40	7 29	1 45	6 19	10 49	9 18 26·2	40312	60·9
12	4 42	7 27	2 42	7 7	11 29	9 22 22·8	24310	60·8
13	4 44	7 25	3 37	7 57	—	9 26 19·3	43201	60·7
14	4 45	7 23	4 27	8 49	0m 17	9 30 15·9	4302●	60·6
15	4 46	7 21	5 9	9 42	1 14	9 34 12·4	4102●	60·5
16	4 47	7 19	5 48	10 35	2 19	9 38 9·0	42013	60·4
17	4 49	7 17	6 22	11 29	3 29	9 42 5·5	21403	60·2
18	4 51	7 15	6 51	—	4 46	9 46 2·1	01234	60·1
19	4 52	7 13	7 19	0m 22	6 4	9 49 58·6	13024	59·9
20	4 53	7 11	7 46	1 15	7 24	9 53 55·2	32014	59·8
21	4 55	7 9	8 14	2 8	8 43	9 57 51·7	31024	59·7
22	4 57	7 7	8 44	3 1	10 2	10 1 48·3	13024	59·6
23	4 59	7 5	9 20	3 56	11 20	10 5 44·9	20134	59·6
24	5 1	7 3	9 59	4 52	0a 35	10 9 41·4	21043	59·5
25	5 2	7 1	10 47	5 48	1 44	10 13 38·0	04123	59·4
26	5 3	6 59	11 41	6 45	2 45	10 17 34·5	14302	59·3
27	5 5	6 57	—	7 41	3 38	10 21 31·1	43201	59·2
28	5 7	6 55	0 42	8 35	4 21	10 25 27·6	4310●	59·1
29	5 8	6 53	1 47	9 27	4 58	10 29 24·2	43012	59·0
30	5 10	6 51	2 55	10 17	5 28	10 33 20·7	4203●	58·8
31	5 12	6 49	4 3	11 4	5 54	10 37 17·3	42103	58·7

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. O indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h.	m.	
New Moon	3	1	26	a.m.
First Quarter	11	1	29	a.m.
Full Moon	18	0	54	p.m.
Last Quarter	25	5	32	a.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches.
London	2·74
Manchester	3·92
Inverness	3·00
Dublin	3·24

August.

MERCURY.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	4 33	0 20	57 32	8 7
6	5 13	0 40	54 26	8 7
11	5 48	0 56	50 58	8 4
16	6 19	1 8	47 19	7 57
21	6 48	1 18	43 39	7 48
26	7 13	1 25	40 3	7 37

Mercury, in Leo and Virgo, is unfavourably situated for observation this month.

Near the Moon on the 3rd.

Its declination is 19° N. on the 1st, 12° N. on the 11th, and 5° N. on the 21st.

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	3 6	11 10	60 8	7 14
6	3 19	11 16	59 5	7 13
11	3 34	11 22	57 46	7 10
16	3 49	11 27	56 14	7 5
21	4 4	11 32	54 30	7 0
26	4 21	11 37	52 34	6 54

Venus, situated in Cancer and Leo, may be seen for a short time before sunrise.

Near the Moon on the 2nd.

Its declination is 22° N. on the 1st, 19° N. on the 11th, and 16° N. on the 21st.

MARS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	0 8	8 17	60 55	4 26
	p.m.			
6	11 58	8 11	61 20	4 23
11	11 52	8 6	61 39	4 20
16	11 45	8 1	61 54	4 16
21	11 38	7 55	62 4	4 12
26	11 30	7 49	62 9	4 7

Mars, situated in Taurus, is visible in the morning.

Near the Moon on the 27th.

Its declination is about 23° North.

JUPITER.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	2 37	10 44	60 42	6 51
6	2 23	10 29	60 34	6 35
11	2 9	10 14	60 25	6 19
16	1 55	9 59	60 16	6 3
21	1 41	9 44	60 6	5 47
26	1 27	9 28	59 56	5 30

Jupiter, situated in Gemini, is also visible in the morning.

Near the Moon on the 29th.

Its declination is about 22° North.

SATURN.

Day	Rises p.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	11 51	7 47	58 20	3 39
6	11 32	7 29	58 23	3 22
11	11 14	7 11	58 26	3 4
16	10 55	6 53	58 29	2 46
21	10 37	6 34	58 31	2 27
26	10 18	6 16	58 33	2 8

Saturn, situated in Taurus, may be seen after midnight.

Near the Moon on the 25th.

Its declination is about 20° North.

September.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites at 3 a.m	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.	W E	°
1	5 13	6 46	5 m 10	11 m 49	6 a 17	10 41 13·8	40123	58·6
2	5 15	6 44	6 16	0 a 33	6 40	10 45 10·4	34102	58·5
3	5 16	6 42	7 22	1 17	7 2	10 49 6·9	3201●	58·4
4	5 18	6 40	8 26	2 0	7 26	10 53 3·5	3104●	58·3
5	5 20	6 37	9 29	2 43	7 49	10 57 0·0	30124	58·1
6	5 21	6 35	10 31	3 27	8 17	11 0 56·6	2034●	57·9
7	5 23	6 32	11 32	4 13	8 49	11 4 53·1	21034	57·7
8	5 25	6 30	0 a 31	5 0	9 27	11 8 49·7	01234	57·5
9	5 26	6 27	1 26	5 48	10 10	11 12 46·2	10324	57·2
10	5 27	6 25	2 16	6 38	11 1	11 16 42·8	32014	57·1
11	5 29	6 22	3 3	7 30	—	11 20 39·4	31204	56·9
12	5 31	6 20	3 41	8 22	0 m 1	11 24 35·9	34012	56·8
13	5 32	6 18	4 16	9 14	1 8	11 28 32·5	24103	56·7
14	5 33	6 16	4 48	10 7	2 20	11 32 29·0	14203	56·5
15	5 35	6 14	5 16	11 0	3 36	11 36 25·6	40123	56·4
16	5 36	6 12	5 45	11 54	4 56	11 40 22·1	41032	56·3
17	5 38	6 10	6 13	—	6 16	11 44 18·7	43201	56·1
18	5 40	6 7	6 44	0 m 49	7 38	11 48 15·2	43120	56·0
19	5 42	6 5	7 18	1 45	9 0	11 52 11·8	34012	55·9
20	5 43	6 2	7 58	2 43	10 19	11 56 8·3	1042●	55·7
21	5 45	6 0	8 44	3 41	11 33	12 0 4·9	20134	55·5
22	5 46	5 58	9 37	4 39	0 a 38	12 4 1·4	0234●	55·4
23	5 48	5 56	10 36	5 36	1 34	12 7 58·0	10324	55·3
24	5 49	5 54	11 40	6 31	2 20	12 11 54·5	32014	55·2
25	5 51	5 52	—	7 24	2 59	12 15 51·1	32104	55·1
26	5 53	5 50	0 m 47	8 14	3 31	12 19 47·6	30124	55·0
27	5 55	5 47	1 55	9 2	3 58	12 23 44·2	1024●	54·8
28	5 56	5 45	3 1	9 47	4 22	12 27 40·7	20413	54·7
29	5 58	5 43	4 7	10 31	4 43	12 31 37·3	403●●	54·5
30	5 59	5 41	5 10	11 14	5 7	12 35 33·8	14032	54·3

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. ○ indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h.	m.	
New Moon	1	2	14	p.m.
First Quarter	9	6	38	p.m.
Full Moon	16	9	41	p.m.
Last Quarter	23	0	51	p.m.

Mean Monthly Rainfall during the Years 1870-79

By G. J. Symons, F.R.S.

	inches
London	2·51
Manchester	3·77
Inverness	2·90
Dublin	2·34

September.

MERCURY.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	7 38	1 30	35 59	7 22
6	7 57	1 32	32 53	7 7
11	8 10	1 31	30 10	6 52
16	8 16	1 26	28 0	6 36
21	8 13	1 15	26 37	6 17
26	7 55	0 56	26 25	5 57

Mercury, in Virgo, is unfavourably situated for observation during this month.

Near the Moon on the 3rd.

Its declination is 3° S. on the 1st, 8° S. on the 11th, and 12° S. on the 21st.

VENUS.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	4 39	11 42	50 2	6 45
6	4 55	11 46	47 47	6 37
11	5 10	11 49	45 25	6 28
16	5 26	11 53	42 58	6 19
21	5 42	11 56	40 28	6 10
26	5 57	11 59	37 57	6 1

Venus, in Leo, is not favourably situated for observation during this month.

Near the Moon on the 1st.

Its declination is 12° N. on the 1st, 7° N. on the 11th, and 2° N. on the 21st.

MARS.

Day	Rises p.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	11 23	7 42	62 9	4 0
6	11 17	7 36	62 5	3 53
11	11 12	7 29	61 57	3 45
16	11 7	7 23	61 45	3 37
21	11 2	7 16	61 30	3 29
26	10 57	7 8	61 12	3 20

Mars, situated in Gemini, may be seen after midnight.

Near the Moon on the 25th.

Its declination is about 23° North.

JUPITER.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	1 10	9 10	59 44	5 10
6	0 55	8 54	59 34	4 53
11	0 40	8 38	59 24	4 36
16	0 24	8 22	59 14	4 19
21	0 9	8 6	59 5	4 3
	p.m.			
26	11 52	7 49	58 56	3 46

Jupiter, situated in Cancer, may be seen in the morning.

Near the Moon on the 25th.

Its declination is about 21° North.

SATURN.

Day	Rises p.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	°	h. m.
1	9 56	5 53	58 34	1 46
6	9 37	5 34	58 35	1 27
11	9 18	5 15	58 35	1 8
16	8 59	4 56	58 35	0 49
21	8 39	4 36	58 35	0 29
26	8 19	4 17	58 34	0 9

Saturn, situated in Taurus, is visible after 10 p.m.

Near the Moon on the 22nd

Its declination is about 20° North.

October.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites at 2.30 a.m.	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.	W E	°
1	6 1	5 40	6 m 15	11 m 57	5 a 30	12 39 30·4	43201	54·1
2	6 3	5 38	7 18	0 a 40	5 54	12 43 26·9	43210	53·8
3	6 5	5 35	8 22	1 24	6 20	12 47 23·5	43012	53·5
4	6 7	5 32	9 23	2 9	6 50	12 51 20·0	41302	53·3
5	6 9	5 30	0 21	2 55	7 25	12 55 16·6	42013	53·0
6	6 10	5 27	11 18	3 43	8 7	12 59 13·1	41203	52·7
7	6 12	5 25	0 a 9	4 31	8 54	13 3 9·7	01423	52·4
8	6 14	5 22	0 56	5 21	9 49	13 7 6·3	23014	52·2
9	6 16	5 20	1 36	6 11	10 51	13 11 2·8	32104	52·0
10	6 17	5 18	2 13	7 2	11 59	13 14 59·4	30214	51·9
11	6 19	5 15	2 44	7 53	—	13 18 55·9	31024	51·7
12	6 20	5 13	3 15	8 45	1 m 11	13 22 52·5	20134	51·6
13	6 22	5 11	3 42	9 38	2 26	13 26 49·0	12034	51·5
14	6 24	5 8	4 10	10 32	3 45	13 30 45·6	01423	51·3
15	6 25	5 6	4 39	11 28	5 7	13 34 42·1	4023●	51·2
16	6 27	5 4	5 13	—	6 30	13 38 38·7	34210	51·2
17	6 28	5 2	5 50	0 m 26	7 52	13 42 35·2	43021	51·1
18	6 30	5 0	6 35	1 25	9 11	13 46 31·8	43102	51·0
19	6 31	4 58	7 27	2 26	10 23	13 50 28·3	42031	50·9
20	6 32	4 56	8 27	3 26	11 25	13 54 24·9	42103	50·7
21	6 34	4 54	9 31	4 24	0 a 17	13 58 21·4	40123	50·5
22	6 36	4 52	10 39	5 19	0 59	14 2 18·0	41023	50·2
23	6 38	4 50	11 47	6 11	1 33	14 6 14·5	12340	49·9
24	6 40	4 47	—	7 0	2 3	14 10 11·1	3014●	49·6
25	6 42	4 45	0 m 53	7 46	2 28	14 14 7·7	3102 4	49·4
26	6 44	4 43	1 59	8 30	2 50	14 18 4·2	20314	49·1
27	6 46	4 41	3 3	9 13	3 13	14 22 0·8	21034	48·9
28	6 48	4 39	4 7	9 55	3 34	14 25 57·3	01234	48·6
29	6 50	4 37	5 10	10 38	3 58	14 29 53·9	10234	48·3
30	6 51	4 36	6 14	11 22	4 23	14 33 50·4	23014	48·1
31	6 53	4 34	7 15	0 a 7	4 53	14 37 47·0	304●●	47·8

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. O indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h.	m.	
New Moon	1	5	54	a.m.
First Quarter	9	10	20	a.m.
Full Moon	16	6	45	a.m.
Last Quarter	22	11	19	p.m.
New Moon	30	11	57	p.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches
London	2·70
Manchester	4·43
Inverness	2·29
Dublin	3·56

October.

MERCURY.

Day	Rises a.m.	Transits p.m.	Altitude.	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	7 18	0 27	27 52	5 36
		a. m.		
6	6 24	11 49	30 59	5 14
11	5 29	11 13	34 33	4 57
16	4 54	10 49	36 38	4 44
21	4 46	10 40	36 27	4 34
26	4 58	10 41	34 30	4 24

Mercury, situated in Virgo, may be seen for a short time towards the end of the month, before sunrise.

Near the Moon on the 2nd.

Its declination is 11° S. on the 1st, 4° S. on the 11th, and 2° S. on the 21st.

VENUS.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	6 14	0 2	35 25	5 50
6	6 30	0 5	32 54	5 41
11	6 46	0 9	30 26	5 32
16	7 3	0 12	28 2	5 22
21	7 19	0 16	25 45	5 13
26	7 35	0 21	23 35	5 6

Venus, in Virgo and Libra, is not favourably situated for observation during this month.

Near the Moon on the 1st and 31st.

Its declination is 3° S. on the 1st, 8° S. on the 11th, and 13° S. on the 21st.

MARS.

Day	Rises p.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	10 51	7 1	60 51	3 9
6	10 45	6 53	60 28	2 58
11	10 39	6 44	60 4	2 47
16	10 33	6 36	59 38	2 36
21	10 28	6 27	59 11	2 24
26	10 22	6 17	58 43	2 11

Mars, situated in Cancer, may be seen after 11 p.m.

Near the Moon on the 23rd.

Its declination is about 23° North.

JUPITER.

Day	Rises p.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	11 35	7 33	58 47	3 28
6	11 19	7 16	58 39	3 10
11	11 3	6 59	58 31	2 52
16	10 46	6 42	58 24	2 34
21	10 28	6 24	58 18	2 16
26	10 10	6 6	58 13	1 58

Jupiter, situated in Cancer, is visible after midnight.

Near the Moon on the 23rd.

Its declination is about 20° North.

SATURN.

Day	Rises p.m.	Transits a.m	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	8 0	3 57	58 33	11 50
6	7 40	3 37	58 32	11 30
11	7 20	3 17	58 30	11 10
16	7 0	2 56	58 28	10 49
21	6 39	2 35	58 25	10 27
26	6 18	2 15	58 22	10 5

Saturn, situated in Taurus, may be seen both evening and morning.

Near the Moon on the 19th.

Its declination is about 20° North.

November.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites at 2 a.m.	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.	W E	°
1	6 55	4 32	8 m 14	0 a 52	5 a 26	14 41 43·5	31402	47·6
2	6 57	4 31	9 13	1 40	6 6	14 45 40·1	4201●	47·3
3	6 59	4 29	10 5	2 28	6 50	14 49 36·6	42103	47·0
4	7 0	4 27	10 53	3 17	7 42	14 53 33·2	40123	46·6
5	7 2	4 25	11 35	4 6	8 41	14 57 29·7	41023	46·2
6	7 4	4 24	0 a 12	4 55	9 44	15 1 26·3	42301	45·8
7	7 5	4 23	0 45	5 45	10 53	15 5 22·9	4320●	45·4
8	7 7	4 22	1 13	6 34	—	15 9 19·4	34102	45·0
9	7 9	4 20	1 41	7 25	0 m 4	15 13 16·0	2401●	44·5
10	7 10	4 19	2 7	8 16	1 20	15 17 12·5	21043	44·1
11	7 12	4 17	2 36	9 9	2 37	15 21 9·1	02134	43·7
12	7 14	4 16	3 5	10 5	3 56	15 25 5·6	10234	43·3
13	7 16	4 14	3 40	11 4	5 18	15 29 2·2	23014	43·0
14	7 18	4 12	4 21	—	6 40	15 32 58·7	32104	42·7
15	7 19	4 11	5 10	0 m 5	7 58	15 36 55·3	13024	42·5
16	7 21	4 10	6 8	1 7	9 7	15 40 51·8	23014	42·3
17	7 23	4 9	7 13	2 8	10 5	15 44 48·4	21043	42·2
18	7 25	4 8	8 21	3 7	10 54	15 48 45·0	40213	42·2
19	7 27	4 7	9 32	4 2	11 33	15 52 41·5	41023	42·2
20	7 28	4 6	10 41	4 54	0 a 5	15 56 38·1	34201	42·1
21	7 30	4 4	11 48	5 42	0 31	16 0 34·6	43210	42·0
22	7 31	4 3	—	6 27	0 55	16 4 31·2	43012	41·9
23	7 33	4 2	0 m 54	7 11	1 18	16 8 27·7	4302●	41·8
24	7 34	4 0	1 59	7 54	1 39	16 12 24·3	42103	41·8
25	7 36	3 59	3 2	8 37	2 3	16 16 20·8	4013●	41·7
26	7 37	3 58	4 5	9 20	2 27	16 20 17·4	10423	41·6
27	7 39	3 57	5 8	10 4	2 55	16 24 14·0	20314	41·6
28	7 40	3 56	6 9	10 50	3 27	16 28 10·5	32104	41·7
29	7 42	3 55	7 7	11 37	4 4	16 32 7·1	30124	41·8
30	7 44	3 54	8 1	0 a 25	4 47	16 36 3·6	3024●	42·0

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. ○ indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h.	m.	
First Quarter	8	0	4	a.m.
Full Moon	14	4	37	p.m.
Last Quarter	21	1	44	p.m.
New Moon	29	6	54	p.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches
London	2·44
Manchester	2·97
Inverness	2·70
Dublin	2·61

November.

MERCURY.

Day	Rises a.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	5 24	10 50	31 0	4 16
6	5 52	11 0	27 47	4 8
11	6 20	11 11	24 38	4 2
16	6 48	11 23	21 42	3 58
21	7 16	11 35	19 6	3 54
26	7 42	11 47	16 54	3 52

Mercury, situated in Virgo, Libra, and Scorpio, may be seen during the first part of the month before sunrise, near the S.E.

Near the Moon on the 29th.

Its declination is 8° S. on the 1st, 14° S. on the 11th, and 19° S. on the 21st.

VENUS.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	7 55	0 27	21 11	4 59
6	8 12	0 32	19 24	4 53
11	8 28	0 38	17 50	4 49
16	8 42	0 45	16 30	4 48
21	8 56	0 52	15 27	4 48
26	9 9	0 59	14 40	4 50

Venus, situated in Libra and Scorpio, may be seen for a short time after sunset.

Near the Moon on the 30th.

Its declination is 17° S. on the 1st, 21° S. on the 11th, and 23° S. on the 21st.

MARS.

Day	Rises p.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	10 13	6 5	58 10	1 55
6	10 5	5 54	57 43	1 42
11	9 55	5 43	57 18	1 29
16	9 45	5 31	56 54	1 14
21	9 35	5 18	56 33	0 58
26	9 24	5 5	56 14	0 41

Mars, situated in Cancer and Leo, is visible after 10 p.m.

Near the Moon on the 20th.

Its declination is about 18° North.

JUPITER.

Day	Rises p.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	9 51	5 45	58 8	1 35
6	9 33	5 26	58 4	1 16
11	9 14	5 7	58 2	0 56
16	8 55	4 48	58 1	0 37
21	8 36	4 29	58 2	0 18
26	8 16	4 9	58 3	0 0

Jupiter, situated in Cancer, may be seen after 10 p.m.

Near the Moon on the 19th.

Its declination is about 20° North.

SATURN.

Day	Rises p.m.	Transits a.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	5 54	1 50	58 19	9 42
6	5 34	1 29	58 16	9 20
11	5 13	1 7	58 12	8 57
16	4 53	0 46	58 9	8 35
21	4 32	0 25	58 5	8 14
26	4 11	0 3	58 1	7 52

Saturn, situated in Taurus, is visible both evening and morning throughout the month.

Near the Moon on the 15th.

Its declination is about 20° North.

December.

Day	Sun		Moon			Sidereal Time at Mean Noon	Configuration of Jupiter's Satellites at 1 a.m.	Mean Temperature at 9 a.m.
	Rises	Sets	Rises	Transits	Sets			
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m. s.	W E	°
1	7 46	3 53	8 m 52	1 a 14	5 a 38	16 40 0·2	21034	42·4
2	7 47	3 52	9 37	2 4	6 34	16 43 56·7	0134●	42·7
3	7 48	3 52	10 15	2 53	7 37	16 47 53·3	10243	43·0
4	7 49	3 51	10 48	3 42	8 43	16 51 49·9	20431	43·3
5	7 51	3 51	11 18	4 31	9 53	16 55 46·4	32410	43·5
6	7 52	3 51	11 44	5 19	11 3	16 59 43·0	43 12	43·6
7	7 53	3 50	0 a 11	6 8	—	17 3 39·5	43102	43·7
8	7 54	3 50	0 37	6 59	0 m 17	17 7 36·1	42013	43·7
9	7 56	3 50	1 5	7 51	1 33	17 11 32·6	42013	43·7
10	7 57	3 49	1 35	8 46	2 52	17 15 29·2	41023	43·6
11	7 58	3 49	2 11	9 44	4 11	17 19 25·8	24013	43·4
12	7 59	3 49	2 54	10 45	5 29	17 23 22·3	23140	43·1
13	8 0	3 49	3 47	11 47	6 43	17 27 18·9	30241	42·7
14	8 1	3 49	4 49	—	7 48	17 31 15·4	31024	42·4
15	8 2	3 49	5 56	0 m 48	8 43	17 35 12·0	2014●	42·0
16	8 3	3 49	7 8	1 46	9 27	17 39 8·5	2034●	41·7
17	8 4	3 49	8 20	2 41	10 2	17 43 5·1	10234	41·4
18	8 5	3 50	9 31	3 33	10 32	17 47 1·7	20134	41·1
19	8 5	3 50	10 40	4 21	11 0	17 50 58·2	21304	40·9
20	8 6	3 50	11 44	5 7	11 23	17 54 54·8	30214	40·7
21	8 6	3 51	—	5 50	11 45	17 58 51·3	31402	40·5
22	8 6	3 51	0 m 51	6 34	0 a 8	18 2 47·9	4201●	40·3
23	8 7	3 52	1 55	7 17	0 31	18 6 44·4	42103	40·2
24	8 7	3 52	2 56	8 0	0 57	18 10 41·0	14023	40·2
25	8 7	3 53	3 57	8 45	1 27	18 14 37·6	40213	40·1
26	8 8	3 53	4 58	9 32	2 2	18 18 34·1	42130	40·0
27	8 8	3 54	5 55	10 20	2 44	18 22 30·7	43021	39·9
28	8 8	3 55	6 47	11 9	3 31	18 26 27·2	34102	39·7
29	8 9	3 56	7 34	11 59	4 26	18 30 23·8	2301●	39·6
30	8 9	3 57	8 15	0 a 49	5 27	18 34 20·3	21043	39·4
31	8 9	3 58	8 51	1 39	6 34	18 38 16·9	10234	39·2

The configurations of Jupiter's satellites represent the relative positions as seen in an inverting telescope. ○ indicates Jupiter—● that the satellite is *on* or *behind* Jupiter's disc.

Phases of the Moon.

	d.	h.	m.	
First Quarter	7	11	46	a.m.
Full Moon	14	3	28	a.m.
Last Quarter	21	8	8	a.m.
New Moon	29	1	0	p.m.

Mean Monthly Rainfall during the Years 1870–79.

By G. J. Symons, F.R.S.

	inches
London	2·17
Manchester	2·53
Inverness	1·84
Dublin	2·89

December.

MERCURY.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	8 8	0 1	15 8	3 54
6	8 31	0 15	13 52	3 59
11	8 52	0 30	13 9	4 8
16	9 8	0 45	13 2	4 22
21	9 19	1 0	13 32	4 41
26	9 23	1 13	14 40	5 3

Mercury, situated in Sagittarius, may be seen during the latter part of the month after sunset in the S.W.

Near the Moon on the 31st.

Its declination is 23° S. on the 1st, 25° S. on the 11th and 21st.

VENUS.

Day	Rises a.m.	Transits p.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	9 20	1 7	14 11	4 54
6	9 29	1 15	14 2	5 0
11	9 37	1 23	14 10	5 9
16	9 42	1 30	14 38	5 20
21	9 42	1 37	15 24	5 32
26	9 42	1 44	16 28	5 46

Venus, also situated in Sagittarius, is visible for a short time after sunset in the S.W.

Near the Moon on the 31st.

Its declination is 24° S. on the 1st and 11th, and 23° S. on the 21st.

MARS.

Day	Rises p.m.	Transits a.m.	Altitude	Sets p.m.
	h. m.	h. m.	° ′	h. m.
1	9 10	4 50	56 0	0 27
6	8 56	4 35	55 49	0 10
				a.m.
11	8 40	4 19	55 44	11 54
16	8 23	4 2	55 43	11 37
21	8 4	3 44	55 49	11 20
26	7 44	3 25	56 1	11 3

Mars, situated in Leo, may be seen after 9 p.m.

Near the Moon on the 18th.

Its declination is about 17° N. throughout the month.

JUPITER.

Day	Rises p.m.	Transits a.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	7 55	3 49	58 6	11 39
6	7 34	3 28	58 10	11 19
11	7 12	3 7	58 15	10 58
16	6 51	2 46	58 20	10 37
21	6 29	2 25	58 27	10 17
26	6 7	2 3	58 35	9 57

Jupiter, situated in Cancer, is visible both evening and morning.

Near the Moon on the 17th.

Its declination is about 20° North.

SATURN.

Day	Rises p.m.	Transits p.m.	Altitude	Sets a.m.
	h. m.	h. m.	° ′	h. m.
1	3 49	11 38	57 56	7 31
6	3 28	11 16	57 53	7 9
11	3 7	10 55	57 49	6 47
16	2 46	10 34	57 46	6 25
21	2 26	10 13	57 43	6 4
26	2 6	9 52	57 40	5 43

Saturn, situated in Taurus may be seen both evening and morning.

Near the Moon on the 13th.

Its declination is about 19° North.

ASTRONOMICAL MEMORANDA.

January.

1 Day breaks at $6^h\ 11^m$, twilight ends at $6^h\ 13^m$, length of day $7^h\ 52^m$.
Distance of Sun from the earth, 90,830,000 miles.

The great Comet discovered by Finlay at the Cape Observatory, on Sept. 7, 1882, may be observed this month, rising in the S.E. The following approximate positions may be found useful.

Day	R.A.	Dec.	Rises aft.	Transits morn.	Alt.	Sets morn.
	h. m.	°	h. m.	h. m.	°	h. m.
1	7 11	29·3 S.	9 8	0 32 aft.	9·2	3 39
6	6 57	28·3	8 36	11 52	10·2	3 14
11	6 45	27·2	7 56	11 21	11·3	2 50
16	6 35	26·1	7 17	10 51	12·4	2 28
21	6 25	24·8	6 38	10 21	13·7	2 8
26	6 16	23·5	6 1	9 53	15·0	1 49
31	6 9	22·2 S	5 25	9 26	16·3	1 31

2 Eclipse reapp. of Jupiter II. Satellite $0^h\ 12^m$ *morn.*
Meteors may be seen in the constellation Bootes.

3 Eclipse reapp. of Jupiter I. Sat. $3^h\ 56^m$ *morn.*

4 Eclipse reapp. of Jupiter I. Sat. $10^h\ 25^m$ *aft.*
Eclipse reapp. of Jupiter III. Sat. $11^h\ 45^m$ *aft.*

6 Venus near the Moon at 8^h *morn.*, distance equal to six diameters of the Moon to the North.

8 Mars near the Moon at 4^h *aft.*, distance equal to nine diameters of the Moon to the South.

9 Eclipse reapp. of Jupiter II. Sat. $2^h\ 48^m$ *morn.*
Venus at least distance from the Sun at 6^h *aft.*

10 Mercury near the Moon at *noon*, distance equal to fourteen diameters of the Moon to the South

11 Venus at greatest brilliancy at 3^h *morn.*
Occultation of *c'* Capricorni ($4\frac{1}{2}$ mag.). Disapp. at $6^h\ 6^m$ *aft.* 90° from the Vertex; reapp. at $6^h\ 39^m$ *aft.*, 25° from the Vertex (as seen in an inverting telescope).

JANUARY—*continued.*

12 Eclipse reapp. of Jupiter I. Sat. $0^h\ 20^m$ *morn.*
Eclipse reapp. of Jupiter III. Sat. $3^h\ 46^m$ *morn.*

13 Eclipse reapp. of Jupiter I. Sat. $6^h\ 49^m$ *aft.*

15 Day breaks at $6^h\ 7^m$, twilight ends at $6^h\ 29^m$, length of day $8^h\ 18^m$.
Distance of Sun from the Earth, 90,880,000 miles.

17 Saturn near the Moon at 7^h *aft.*, distance equal to four diameters of the Moon to the South.

19 Near approach of ϵ Tauri ($3\frac{1}{2}$ mag.) to the Moon at $2^h\ 3^m$ *morn.* 40° from the Vertex.
Eclipse reapp. of Jupiter I. Sat. $2^h\ 15^m$ *morn.*
Eclipse reapp. of Jupiter II. Sat. $6^h\ 41^m$ *aft.*

20 Jupiter near the Moon at 4^h *morn.*, distance equal to five diameters of the Moon to the North.
Venus near η Ophiuchi at 4^h *morn.*, star situated 2° 21′ North.
Eclipse reapp. of Jupiter I. Sat. at $8^h\ 44^m$ *aft.*

21 Saturn stationary at 8^h *morn.*

22 Mercury in the ascending Node, 2^h *morn.*
Mercury at greatest distance East of the Sun (18° 32′), at 11^h *morn.*

26 Eclipse reapp. of Jupiter I. Sat. at $4^h\ 11^m$ *morn.*
Mercury at least distance from the Sun 4^h *aft.*
Neptune stationary at 9^h *aft.*
Eclipse reapp. of Jupiter II. Sat. at $9^h\ 17^m$ *aft.*

27 Mercury stationary at Noon.
Eclipse reapp. of Jupiter I. Sat. at $10^h\ 40^m$ *aft.*

31 Venus at its greatest Heliocentric Latitude North at 9^h *aft.*

In the middle of this month the constellations Camelopardalus, Lynx, Auriga, Gemini, Monoceros, and Canis Major will be near the Meridian at *midnight.*

During this month the mornings increase 25^m, and the afternoons 46^m.

February.

1 Day breaks at $5^h\ 52^m$, twilight ends at $6^h\ 52^m$, length of day $9^h\ 7^m$.
Distance of Sun from the Earth, 91,050,000 miles.

3 Eclipse reapp. of Jupiter II. Sat. at $11^h\ 52^m$ *aft.*

FEBRUARY—*continued.*

4 Eclipse reapp. of Jupiter I. Sat. at $0^h\ 35^m$ *morn.*
Venus near the Moon at 5^h *morn.*, distance equal to $1\frac{1}{2}$ diameters of the Moon to the North.

5 Mercury at greatest Heliocentric Latitude North.
Eclipse reapp. of Jupiter I. Sat. at $7^h\ 4^m$ *aft.*
Mercury in inferior conjunction with the Sun at 11^h *aft.*

6 Mars near the Moon at 7^h *aft.*, distance equal to twelve diameters of the Moon to the South.

7 Mercury near the Moon at 1^h *aft.*, distance equal to three diameters of the Moon to the South.

9 Eclipse reapp. of Jupiter III. Sat. at $7^h\ 52^m$ *aft.*

10 Eclipse reapp. of Jupiter II. Sat. at $2^h\ 28^m$ *morn.*

11 Eclipse reapp. of Jupiter I. Sat. at $2^h\ 31^m$ *morn.*

12 Eclipse reapp. of Jupiter I. Sat. at $9^h\ 0^m$ *aft.*

13 Mercury near Mars at *noon* situated 4° 22′ North.

14 Saturn near the Moon at 1^h *morn.*, distance equal to three diameters of the Moon to the South.

15 Day breaks at $5^h\ 31^m$, twilight ends at $7^h\ 14^m$, length of day $9^h\ 56^m$.
Distance of Sun from the Earth, 91,280,000 miles.
Jupiter stationary at 7^h *morn.*

16 Venus at greatest distance West of the Sun (46° 45′), at 6^h *morn.*
Jupiter near the Moon at 8^h *morn.*, distance equal to five diameters of the Moon to the North.
Eclipse disapp. of Jupiter III. Sat. at $9^h\ 13^m$ *aft.*
Eclipse reapp. of Jupiter III. Sat. at $11^h\ 54^m$ *aft.*

17 Mercury stationary at 9^h *aft.*

19 Eclipse reapp. of Jupiter I. Sat. at $10^h\ 55^m$ *aft.*

20 Eclipse reapp. of Jupiter II. Sat. at $6^h\ 21^m$ *aft.*
Venus near π Sagittarii at 11^h *morn.*, star situated 1° 30′ S.
Meteors may be looked for in the constellation Hercules.

24 Eclipse disapp. of Jupiter III. Sat. at $1^h\ 14^m$ *morn.*

25 Occultation of χ Virginis (5 mag.). Disapp. at $2^h\ 20^m$ *morn*, 78° from the Vertex; reapp. at $3^h\ 40^m$ *morn.*, 246° from the Vertex (as seen in an inverting telescope).

27 Eclipse reapp. of Jupiter I. Sat. at $0^h\ 51^m$ *morn.*
Eclipse reapp. of Jupiter II. Sat. at $8^h\ 56^m$ *aft.*

FEBRUARY—*continued.*

28 Eclipse reapp. of Jupiter I. Sat. at $7^h\ 20^m$ *aft.*

In the middle of this month the constellations Lynx, Cancer, and Hydra are near the Meridian at *midnight*.

During this month the mornings increase 49^m, and the afternoons 48^m.

March.

1 Day breaks at $5^h\ 4^m$, twilight ends at $7^h\ 39^m$, length of day $10^h\ 54^m$.
Distance of Sun from the Earth, 91,580,000 miles.
Mercury in descending Node at 11^h *morn.*

3 Mercury at greatest distance West of the Sun (27° 13′), at 5^h *aft.*

5 Venus near the Moon at 10^h *aft.*, distance equal to six diameters of the Moon to the South.

6 Eclipse reapp. of Jupiter II. Sat. at $11^h\ 31^m$ *aft.*

7 Mercury near the Moon at 11^h *morn.*, distance equal to twelve diameters of the Moon to the South.
Meteors may be seen in the constellation Hercules.
Mars near the Moon at 8^h *aft.*, distance equal to thirteen diameters of the Moon to the South.
Eclipse reapp. of Jupiter I. Sat. at $9^h\ 16^m$ *aft.*

9 Mercury near δ Capricorni, at 6^h *aft.*, star situated 1° 24′ South.

11 Mercury at greatest distance from the Sun at 3^h *aft.*

12 Uranus in opposition to the Sun at 5^h *morn.*

13 Saturn near the Moon at 11^h *morn.*, distance equal to two diameters of the Moon to the South.

14 Eclipse reapp. of Jupiter I. Sat. at $11^h\ 12^m$ *aft.*

15 Day breaks at $4^h\ 32^m$, twilight ends at $8^h\ 4^m$, length of day $11^h\ 46^m$.
Distance of Sun from the Earth, 91,920,000 miles.
Jupiter near the Moon at 4^h *aft.*, distance equal to six diameters of the Moon to the North.

17 Mercury near Mars at 5^h *aft.*, situated 0° 57′ South.

20 Mars at greatest Heliocentric Latitude South.
Sun enters Aries at 11^h *aft.* Spring commences.

23 Eclipse reapp. of Jupiter I. Sat. at $7^h\ 37^m$ *aft.*

24 Eclipse reapp. of Jupiter III. Sat. at $8^h\ 3^m$ *aft.*

MARCH—*continued.*

27 Venus near δ Capricorni at 1h *morn.*, star situated 2° 53′ South.

28 Venus in descending Node at 11h *aft.*

29 Occultation of ψ Ophiuchi (5 mag.). Disapp. at 0h 0m *morn.*, 87° from the Vertex; disapp. at 0h 54m *morn.*, 190° from the Vertex (as seen in an inverting telescope).

30 Eclipse reapp. of Jupiter I. Sat. at 9h 32m *aft.*

31 Eclipse reapp. of Jupiter II. Sat. at 8h 35m *aft.*
Eclipse disapp. of Jupiter III. Sat. at 9h 17m *aft.*

In the middle of this month the constellations Cepheus, Ursa Major, Leo, Crater, and Hydra are near the Meridian at *midnight.*
During this month the mornings increase 1h 7m and the afternoons 53m.

April.

1 Day breaks at 3h 47m, twilight ends at 8h 39m, length of day 12h 53m.
Distance of Sun from the Earth, 92,370,000 miles.
Eclipse reapp. of Jupiter III. Sat. at 0h 5m *morn.*
Mercury at greatest Heliocentric Latitude South.

4 Venus near the Moon at 6h *aft.*, distance equal to eleven diameters of the Moon to the South.
Eclipse disapp. of Jupiter IV. Sat. at 9h 34m *aft.*
Eclipse reapp. of Jupiter IV. Sat. at 11h 0m *aft.*

5 Mars near the Moon at 7h *aft.*, distance equal to eleven diameters of the Moon to the South.

6 Eclipse reapp. of Jupiter I. Sat. at 11h 28m *aft.*
Mercury near the Moon at *midnight*, distance equal to ten diameters of the Moon to the South.

10 Saturn near the Moon at 1h *morn.*, distance about a diameter of the Moon to the South.

10–12 Meteors may be seen in the constellation Draco.

12 Jupiter near the Moon at 6h *morn.*, distance equal to seven diameters of the Moon to the North.

13 Mars at least distance from the Sun at 3h *aft.*
Occultation of λ Geminorum (3½ mag.). Disapp. at 8h 20m *aft.*, 58° from the Vertex; reapp. at 9h 6m *aft.*, 342° from the Vertex, as seen in an inverting telescope.

APRIL—*continued.*

15 Day breaks at 3^h 6^m, twilight ends at 9^h 12^m, length of day 13^h 46^m.
Distance of Sun from the Earth, 92,730,000 miles.
Eclipse reapp. of Jupiter I. Sat. at 7^h 53^m *aft.*

16 Mercury in superior conjunction with the Sun at 11^h *morn.*

19, 20 Meteors may be seen in the constellation Lyra.

20 Mercury in ascending Node.
Near approach of ψ Virginis to the Moon at 11^h 47^m *aft.*, 344° from the Vertex.

22 Partial Eclipse of the Moon, *invisible* in the British Isles.
First contact with the Penumbra 9^h $8{\cdot}2^m$ *morn.*
First contact with the Shadow 11^h $3{\cdot}1^m$ *morn.*
Middle of the Eclipse 11^h $38{\cdot}6^m$ *morn.*
Last contact with the Shadow 0^h $14{\cdot}1^m$ *aft.*
Last contact with the Penumbra 2^h $9{\cdot}0^m$ *aft.*
Magnitude of the Eclipse (Moon's diameter = 1) 0·085.
Eclipse reapp. of Jupiter I. Sat. at 9^h 48^m *aft.*

24 Mercury at least distance from the Sun at 3^h *aft.*

27 Mercury near Neptune at 8^h *morn.*, situated 3° 7′ South.

30 Meteors may be seen in the constellation Aquarius.

In the middle of the month the constellations Cassiopeia, Canes Venatici, Virgo, Corvus, and Centaurus will be near the Meridian at *midnight.*

During this month the mornings increase 1^h 1^m and the afternoons 48^m.

May.

1 Day breaks at 2^h 13^m, twilight ends at 9^h 59^m, length of day 14^h 46^m.
Sun's distance from the Earth, 93,130,000 miles.

2 Mercury near Saturn at 4^h *morn.*, situated 3° 54′ North.
Venus at greatest distance from the Sun at 4^h *morn.*

4 Venus near the Moon at *noon*, distance equal to nine diameters of the Moon to the South.
Mars near the Moon at 4^h *aft.*, distance equal to eight diameters of the Moon to the South.
Mercury at greatest Heliocentric Latitude North.

6 Total Eclipse of the Sun *invisible* in the British Isles.
Begins on the Earth generally 7^h $21{\cdot}3^m$ *aft.*, in Long. 167° 11′ E. and Lat. 26° 10′ S.
Central Eclipse begins generally 8^h $20{\cdot}3^m$ *aft.*, in Long. 155° 56′ E. and Lat. 34° 47′ S.
Central Eclipse at *noon* 9^h $45{\cdot}2^m$ *aft.*, in Long. 147° 12′ W. and Lat. 9° 11′ S.
Central Eclipse ends generally 11^h $27{\cdot}5^m$ *aft.*, in Long. 86° 53′ W. and Lat. 13° 35′ S.

MAY—*continued.*

7 Ends on the Earth generally 0^h $26{\cdot}6^m$ *morn.*, in Long. 98° 58′ W. and Lat. 4° 48′ S.
Saturn near the Moon at 5^h *aft.*, distance equal to about a half the diameter of the Moon to the South.

8 Mercury near the Moon at 8^h *morn.*, distance equal to nine diameters of the Moon to the North.

9 Neptune in conjunction with the Sun at 1^h *aft.*
Jupiter near the Moon at *midnight*, distance equal to eight diameters of the Moon to the North.

10 Venus near Mars at 6^h *morn.*, situated 0° 48′ to the South.

13 Eclipse disapp. of Jupiter III. Sat. at 9^h 18^m *aft.*

14 Mercury at greatest distance East of the Sun (21° 48′), at 2^h *aft.*

15 Day breaks at 1^h 17^m, twilight ends at 10^h 56^m, length of day 15^h 31^m.
Sun's distance from the Earth, 93,430,000 miles.

17 Occultation of χ Virginis (5 mag.). Disapp. at 9^h 27^m *aft.*, 79° from the Vertex; reapp. at 10^h 48^m *aft.*, 258° from the Vertex (as seen in an inverting telescope).

19 Jupiter in the ascending Node at 7^h *aft.*

20 Saturn in conjunction with the Sun at 11^h *aft.*

23 Jupiter near μ Geminorum at 8^h *morn.*, star situated 0° 50′ to the South.

24 Venus at greatest Heliocentric Latitude South at 7^h *aft.*

27 Mercury stationary at 8^h *morn.*
Uranus stationary at 8^h *aft.*

28 Mercury in the descending Node at 11^h *morn.*

In the middle of the month the constellations Draco, Libra, Bootis, and Lupus will be near the Meridian at *midnight.*

During this month the mornings increase 43^m and the afternoons 42^m.

June.

1 During this month there is no real night, but constant day or twilight; length of day 16^h 13^m.
Sun's distance from the Earth, 93,710,000 miles.

2 Mars near the Moon at 11^h *morn.*, distance equal to three diameters of the Moon to the North.

3 Venus near the Moon at 4^h *morn.*, distance equal to three diameters of the Moon to the South.

JUNE—*continued.*

5 Mercury near the Moon at 1^h *aft.*, distance equal to two diameters of the Moon to the North.

6 Jupiter near the Moon at 9^h *aft.*, distance equal to nine diameters of the Moon to the North.

7 Mercury at its greatest distance from the Sun at 3^h *aft.*
Occultation of 68 Geminorum (5½ mag.). Disapp. at 9^h 18^m *aft.*, 102° from the Vertex; reapp. (star below the horizon of Greenwich) at 10^h 7^m *aft.*, 304° from the Vertex.

8 Mercury in inferior conjunction with the Sun at 4^h *morn.*
Venus near Neptune at 1^h *aft.*, situated 0° 9′ to the North.

10 Uranus in quadrature with the Sun at 1^h *aft.*

15 Length of day equal to 16^h 32^m.
Sun's distance from the Earth, 93,860,000 miles.

19 Venus near Saturn at *midnight*, situated 0° 35′ to the North.

20 Mercury stationary at 2^h *morn.*

21 Sun enters Cancer. Summer commences at 7^h *aft.*

27 Mars near Neptune at 4^h *morn.*, situated 1° 7′ to the North.
Mercury at greatest Heliocentric Latitude South at *midnight.*

In the middle of this month the constellations Camelopardalus, Draco, Hercules, Ophiuchus, and Scorpio will be near the Meridian at *midnight.*

During this month the mornings increase 4^m and the afternoons 14^m.

July.

1 During this month there is no real night, but constant day or twilight; length of day 16^h 30^m.
Sun's distance from the Earth, 93,930,000 miles.
Mars near the Moon at 4^h *morn.*, distance equal to a diameter of the Moon to the North.
Saturn near the Moon at 11^h *aft.*, situated 0° 22′ to the North.

2 Mercury at its greatest distance West of the Sun (21° 26′) at 11^h *morn.*
Venus near the Moon at 11^h *aft.*, distance equal to five diameters of the Moon to the North.
Mercury near the Moon at *midnight*, situated 0° 17′ to the North.

3 Sun at its greatest distance from the Earth at 5^h *aft.*

4 Mercury near Venus at 6^h *morn.*, situated 2° 2′ to the South.
Jupiter near the Moon at 5^h *aft.*, distance equal to nine diameters of the Moon to the North.

SEPTEMBER—*continued.*

5–17 Meteors may be seen in the constellation Perseus.

6 Eclipse disapp. of Jupiter I. Sat. at $2^h\ 19^m$ *morn.*

11 Mercury at its greatest distance East of the Sun (26° 42′), at 5^h *morn.*

13 Eclipse disapp. of Jupiter I. Sat. at $4^h\ 12^m$ *morn.*
Venus at greatest Heliocentric Latitude North at 2^h *aft.*

14 Occultation of σ Capricorni ($4\frac{1}{2}$ mag.). Disapp. at $8^h\ 44^m$ *aft.*, 171° from the Vertex; reapp. at $9^h\ 5^m$ *aft.*, 208° from the Vertex (as seen in an inverting telescope).

15 Day breaks at $3^h\ 45^m$, twilight ends at $8^h\ 21^m$, length of day $12^h\ 39^m$.
Distance of Sun from the Earth, 92,850,000 miles.

16 Uranus in conjunction with the Sun at *noon.*

17 Venus near Uranus at 4^h *aft.*, situated 0° 45′ North.

20 Venus in superior conjunction with the Sun at 11^h *aft.*

22 Saturn near the Moon at 2^h *morn.*, distance equal to two diameters of the Moon to the North.
Saturn stationary at 6^h *aft.*

23 Sun enters Libra at 11^h *morn.* Autumn commences.
Mercury at greatest Heliocentric Latitude South at *midnight.*

24 Mercury stationary at 11^h *morn.*

25 Mars near the Moon at 1^h *morn.*, distance equal to twelve diameters of the Moon to the North.
Jupiter near the Moon at 9^h *aft.*, distance equal to eleven diameters of the Moon to the North.

27 Eclipse disapp. of Jupiter III. Sat. at $0^h\ 58^m$ *morn.*
Eclipse reapp. of Jupiter III. Sat. at $4^h\ 12^m$ *morn.*

29 Eclipse disapp. of Jupiter I. Sat. at $2^h\ 27^m$ *morn.*

In the middle of this month the constellations Cepheus, Pegasus, Aquarius, and Piscis Australis will be near the Meridian at *midnight.*

During this month the mornings decrease 46^m and the afternoons $1^h\ 5^m$.

October.

1 Day breaks at $4^h\ 15^m$, twilight ends at $7^h\ 39^m$, length of day $11^h\ 39^m$.
Distance of the Sun from the Earth, 92,440,000 miles.
Venus near the Moon at 3^h *aft.*, distance equal to six diameters of the Moon to the North.

OCTOBER—*continued.*

2 Mercury near the Moon at 3^h *morn.*, distance equal to four diameters of the Moon to the South.

2-7 Meteors may be seen in the constellation Camelopardalus.

4 Eclipse disapp. of Jupiter III. Sat. at $4^h\ 56^m$ *morn.*
Mercury near Venus at 3^h *aft.*, situated $4°\ 11'$ South.

6 Eclipse disapp. of Jupiter II. Sat. at $2^h\ 42^m$ *morn.*
Eclipse disapp. of Jupiter IV. Sat. at $3^h\ 41^m$ *morn.*
Eclipse disapp. of Jupiter I. Sat. at $4^h\ 20^m$ *morn.*

7 Mercury in inferior conjunction with the Sun at 1^h *morn.*

12 Mercury in the Ascending Node.

13 Eclipse disapp. of Jupiter II. Sat. at $5^h\ 18^m$ *morn.*

14–20 Meteors may be seen in the constellation Aries.

15 Day breaks at $4^h\ 39^m$, twilight ends at $7^h\ 7^m$, length of day $10^h\ 41^m$.
Sun's distance from the Earth, 92,060,000 miles.

16 Eclipse of the Moon, *partly visible* at Greenwich, as the Moon sets at $6^h\ 30^m$ *morn.*
First contact with the Penumbra $4^h\ 42{\cdot}4^m$ *morn.*
First contact with the Shadow $5^h\ 59{\cdot}1^m$ *morn.*
Middle of the Eclipse $6^h\ 54{\cdot}3$ *morn.*
Last contact with the Shadow $7^h\ 49{\cdot}5^m$ *morn.*
Last contact with the Penumbra $9^h\ 6{\cdot}2$ *morn.*
The first contact with the shadow occurs at 132° from the North Point of the Moon's limb towards the East.
The last contact at 165° towards the West; in each case for direct image.
Magnitude of the eclipse (Moon's diam. = 1) 0·277.

17 Mercury at least distance from the Sun at 2^h *aft.*

17–20 Meteors may be seen in the constellation Orion.

19 Saturn near the Moon at 9^h *morn.*, distance equal to two diameters of the Moon to the North.
Mars near Jupiter at 7^h *aft.*, situated $0°\ 59'$ North.

20 Mercury near γ Virginis at 7^h *aft.*, star situated $1°\ 8'$ North.

22 Occultation of λ Geminorum ($3\frac{1}{2}$ mag.). Disapp. at $0^h\ 1^m$ *morn.*, 55° from the Vertex; reapp. at $1^h\ 2^m$ *morn.*, 216° from the Vertex (as seen in an inverting telescope).
Eclipse disapp. of Jupiter I. Sat. at $2^h\ 35^m$ *morn.*
Mercury at its greatest distance West of the Sun (18° 16'), at *noon.*

OCTOBER—*continued.*

23 Eclipse reapp. of Jupiter IV. Sat. $1^h\ 27^m$ *morn.*
Jupiter near the Moon at 9^h *morn.*, distance equal to eleven diameters of the Moon to the North.
Mars near the Moon at Noon, distance equal to thirteen diameters of the Moon to the North.

27 Jupiter in quadrature with the Sun at 7^h *morn.*
Mercury at greatest Heliocentric Latitude North at 8^h *aft.*

29 Eclipse disapp. of Jupiter I. Sat. at $4^h\ 28^m$ *morn.*
Mercury near the Moon at 3^h *aft.*, distance equal to seven diameters of the Moon to the North.

30 Eclipse disapp. of Jupiter II. Sat. at $11^h\ 50^m$ *aft.*
Annular Eclipse of the Sun *invisible* in the British Isles.
Begins on the Earth generally $8^h\ 53{\cdot}4^m$ *aft.*
Central Eclipse begins generally $10^h\ 8{\cdot}2^m$ *aft.*
Central Eclipse at *noon* $11^h\ 36{\cdot}8^m$ *aft.*

31 Central Eclipse ends generally $1^h\ 33{\cdot}7$ *morn.*
Ends on the Earth generally $2^h\ 48{\cdot}5^m$ *morn.*
Venus near the Moon at 11^h *aft.*, distance equal to two diameters of the Moon to the South.

In the middle of this month the constellations Cassiopeia, Andromeda, and Pisces will be near the Meridian at *midnight.*

During this month the mornings decrease 52^m, and the afternoons $1^h\ 6^m$.

November.

1 Day breaks at $5^h\ 7^m$, twilight ends at $6^h\ 35^m$, length of day $9^h\ 37^m$.
Sun's distance from the Earth, 91,640,000 miles.
Mars in quadrature with the Sun at 7^h *morn.*

1–4 Meteors may be observed in the constellation Aries.

2 Eclipse reapp. of Jupiter III. Sat. at $0^h\ 6^m$ *morn.*
Saturn near α Tauri (Aldebaran) at 5^h *morn.*, star situated 3° 30′ South.

7 Eclipse disapp. of Jupiter I. Sat. at $0^h\ 49^m$ *morn.*
Eclipse disapp. of Jupiter II. Sat. at $2^h\ 26^m$ *morn.*

8 Venus in the Descending Node at 3^h *aft.*

9 Eclipse disapp. of Jupiter III. Sat. at $0^h\ 46^m$ *morn.*
Eclipse reapp. of Jupiter III. Sat. at $4^h\ 4^m$ *morn.*

12 Neptune in opposition to the Sun at 9^h *morn.*

13–14 Meteors may be observed in the constellation Leo.

NOVEMBER—*continued.*

14 Eclipse disapp. of Jupiter I. Sat. at $2^h\ 42^m$ *morn.*
Eclipse disapp. of Jupiter II. Sat. at $5^h\ 2^m$ *morn.*

15 Day breaks at $5^h\ 29^m$, twilight ends at $6^h\ 16^m$, length of day $8^h\ 52^m$.
Sun's distance from the Earth, 91,330,000 miles.
Saturn near the Moon at 5^h *aft.*, distance equal to two diameters of the Moon to the North.

16 Near approach of *i* Tauri ($5\frac{1}{2}$ mag.) to the Moon at $0^h{\cdot}33^m$ *morn.*, 176° from the Vertex.
Eclipse disapp. of Jupiter III. Sat. at $4^h\ 44^m$ *morn.*

19 Jupiter near the Moon at 7^h *aft.*, distance equal to eleven diameters of the Moon to the North.

20 Mercury in the Descending Node at 8^h *morn.*
Mars near the Moon at 6^h *aft.*, distance equal to fifteen diameters of the Moon to the North.

21 Eclipse disapp. of Jupiter I. Sat. at $4^h\ 35^m$ *morn.*
Jupiter stationary at 3^h *aft.*

22 Eclipse disapp. of Jupiter I. Sat. at $11^h\ 4^m$ *aft.*

26 Mercury in superior conjunction with the Sun at 6^h *morn.*

27 Meteors may be observed in the constellation Andromeda.

28 Eclipse disapp. of Jupiter I. Sat. at $6^h\ 29^m$ *morn.*

29 Saturn in opposition to the Sun at 4^h *morn.*
Mercury near the Moon at 10^h *aft.*, distance equal to eight diameters of the Moon to the South.

30 Eclipse disapp. of Jupiter I. Sat. at $0^h\ 57^m$ *morn.*
Mercury at its greatest distance from the Sun at 1^h *aft.*

In the middle of this month the constellations Eridanus, Perseus, Cassiopeia, Cetus, and Aries will be near the meridian at *midnight.*

During this month the mornings decrease 49^m, and the afternoons 38^m.

December.

1 Day breaks at $5^h\ 49^m$, twilight ends at $6^h\ 4^m$, length of day $8^h\ 7^m$.
Sun's distance from the Earth, 91,060,000 miles.
Venus near the Moon at 10^h *morn.*, distance equal to ten diameters of the Moon to the South.
Eclipse disapp. of Jupiter II. Sat. at $11^h\ 32^m$ *aft.*

1–12 Meteors may be observed in the constellation Taurus.

DECEMBER—*continued.*

7 Eclipse disapp. of Jupiter I. Sat. at $2^h\ 50^m$ *morn.*

8 Eclipse disapp. of Jupiter I. Sat. at $9^h\ 18^m$ *aft.*
Meteors may be observed in the constellation Leo.

9 Eclipse disapp. of Jupiter II. Sat. at $2^h\ 9^m$ *morn.*

9–12 Meteors may be observed in the constellation Gemini.

12 Eclipse disapp. of Jupiter IV. Sat. at $3^h\ 40^m$ *morn.*

13 Saturn near the Moon at 1^h *morn.*, distance equal to a diameter of the Moon to the North.
Occultation of δ^3 Tauri (5 mag.). Disapp. at $2^h\ 36^m$ *morn.*, 92° from the Vertex; reapp. at $3^h\ 23^m$ *morn.*, 351° from the Vertex (as seen in an inverting telescope).

14 Eclipse disapp. of Jupiter I. Sat. at $4^h\ 43^m$ *morn.*
Eclipse disapp. of Jupiter III. Sat. at $8^h\ 36^m$ *aft.*

15 Day breaks at $6^h\ 3^m$, twilight ends at $6^h\ 3^m$, length of day $7^h\ 47^m$.
Sun's distance from the Earth, 90,900,000 miles.
Occultation of λ Geminorum ($3\frac{1}{2}$ mag.). Disapp. at $7^h\ 20^m$ *aft.*, 37° from the Vertex; reapp. at $8^h\ 14^m$ *aft.*, 236° from the Vertex (as seen in an inverting telescope).
Eclipse disapp. of Jupiter I. Sat. at $11^h\ 12^m$ *aft.*

16 Eclipse disapp. of Jupiter II. Sat. at $4^h\ 45^m$ *morn.*

17 Jupiter near the Moon at 3^h *morn.*, distance equal to eleven diameters of the Moon to the North.

18 Mars near the Moon at 2^h *aft.*, distance equal to sixteen diameters of the Moon to the North.

20 Uranus in quadrature with the Sun at 7^h *morn.*
Mercury at its greatest Heliocentric Latitude South at 11^h *aft.*

21 Eclipse disapp. of Jupiter I. Sat. at $6^h\ 37^m$ *morn.*

22 Eclipse disapp. of Jupiter III. Sat. at $0^h\ 35^m$ *morn.*
Sun enters Capricornus at 4^h *morn.* Winter commences.

23 Eclipse disapp. of Jupiter I. Sat. at $1^h\ 5^m$ *morn.*

24 Mars stationary at 9^h *morn.*
Eclipse disapp. of Jupiter I. Sat. at $7^h\ 44^m$ *aft.*

26 Eclipse disapp. of Jupiter II. Sat. at $8^h\ 39^m$ *aft.*

28 Eclipse disapp. of Jupiter IV. Sat. at $9^h\ 40^m$ *aft.*

29 Eclipse reapp. of Jupiter IV. Sat. at $1^h\ 50^m$ *morn.*
Eclipse disapp. of Jupiter III. Sat. at $4^h\ 33^m$ *morn.*

30 Eclipse disapp. of Jupiter I. Sat. at $2^h\ 59^m$ *morn.*

DECEMBER—*continued.*

31 Mercury near the Moon at 6^h *morn.*, distance equal to thirteen diameters of the Moon to the South.

Venus near the Moon at 8^h *aft.*, distance equal to thirteen diameters of the Moon to the South.

Eclipse disapp. of Jupiter I. Sat. at $9^h\ 27^m$ *aft.*

In the middle of this month the constellations Draco, Camelopardalus, Perseus, Orion, and Taurus will be near the Meridian at *midnight.*

During this month the mornings decrease 23^m, and afternoons increase 5^m.

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TRANSIT INSTRUMENT,

AS APPLIED TO THE DETERMINATION OF TIME,

FOR THE USE OF COUNTRY GENTLEMEN.

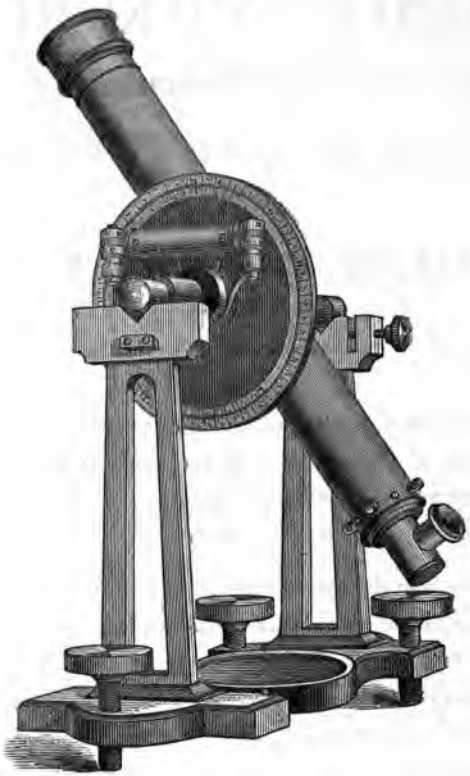
BY

LATIMER CLARK, M.I.C.E.

This work gives a popular description of the instrument, and shows that its use is of the simplest character, requiring neither scientific knowledge nor calculation of any kind, and that it may be easily employed by anyone who may desire to obtain accurate time.

One of the most charming features of the instrument is that it finds its own stars for us, thus requiring no previous acquaintance with astronomy. It also indicates its own errors; and, since the precision of the movements of the heavenly bodies is absolute, the systematic discovery and elimination of these errors, and the gradual rectification of the observer's meridian, becomes a work of great interest and amusement.

London:
ALFRED J. FROST, 6 Westminster Chambers, Victoria Street, S.W



TRANSIT INSTRUMENT. *Price £8.*

This instrument (which is nearly correctly represented in the woodcut) has a telescope 13 inches in length, with object glass 1⅛-inch aperture. The axis of gun metal is 7 inches long, with ⅝-inch trunnion resting on gun-metal bearings; the declination circle 4½-inch diameter, with vernier reading to minutes. It can be turned on the axis, and has clamping screws for adjustment to any latitude. Vernier, with 3-inch level and arm for setting it in position; diagonal eye-piece for observing vertical stars, with three wires and adjustment screws; two dark glasses for observing the sun. Front illuminator. Stand of cast iron, with large levelling screws, the supports carrying gun-metal Y's, with azimuth screws for horizontal adjustment. Striding level of great delicacy, 7 inches long. Power sufficient to show the larger stars and planets in full sunshine. The workmanship, both optically and mechanically, of very high quality... ... £8 0 0

CANDLE LAMP, specially adapted for the above instrument, carried on parallel movement to adjust its height to all positions of the instrument, and with downward reflector for making notes or reading a watch 0 17 6

NOTE.—*The above Transit Instrument will be forwarded for inspection to private gentlemen on receipt of a Banker's reference, and an undertaking to pay the cost of carriage if returned.*

TRANSIT INSTRUMENT. *Price £9.*

(CLARK'S PATENT.)

This instrument is similar to the above, but embodies certain important improvements which have been made the subject of a patent, and which add greatly to the convenience and comfort of using the instrument. The front cap has a hinged diaphragm which serves for illumination of the cross wires, and, when closed, enables a meridian mark to be focussed at 30 yards' distance, or even nearer, which is a point of importance in some situations, and is useful in foggy weather and at night. The vernier carries an arm which clamps firmly on the circle, and rests against a stop on the framework, so that in finding a star it is not necessary to use the declination level; and, while observing, the position of the instrument is not liable to be deranged by an accidental blow from the rim of the hat or other cause; a fine adjusting screw brings the sun or star perfectly on the line. The stand of the instrument is fixed to its base by an elastic attachment which allows perfect freedom of play to the levelling screws... ... ... £9 0 0

CANDLE LAMP AND SUPPORT, as above described ... 0 17 6

BOX for containing instrument and level when not in use 0 7 6

PENDULUM AND SUPPORT for outdoor use, beating half-seconds, to be fixed near the transit instrument 0 5 0

Magnifying Lens for setting the vernier and altitude circle, so attached as to be carried with the vernier in all positions. Collars for adjusting the eye-piece permanently to the observer's vision. Improved Meridian Mark of excellent design, with inclined reflector for day or night use. Also Regulators, Marine Chronometers, Chronoscopes, and all other instruments and accessories required for the determination of time.

ALFRED J. FROST, 6 Westminster Chambers, Victoria Street, S.W.

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